FINAL REPORT

Control of Manganese Dioxide Particles Resulting From In Situ Chemical Oxidation Using Permanganate

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Acronyms

1-D	1-dimensional
2-D	2-dimensional
3-D	3-dimensional
AA	atomic absorption spectroscopy
A_{max}	maximum absorbance (418nm measurements)
C	celcius
Ca	calcium
DNAPL	dense non-aqueous phase liquid
Eh	redox potential
Eqn	equation
Fe	iron
FeO(OH)	goethite
GA	gum arabic
GC	gas chromatography
gpm	gallons per minute
GW	groundwater
HMP	sodium hexametaphosphate
hr	hour
ISCO	in situ chemical oxidation
$KMnO_4$	potassium permanganate
L	liter
M	molar
mg	milligram
min	minute
mL	milliliter
Mn^{2+}	dissolved manganese ion
MnO_2	manganese dioxide
MnO_4^-	permanganate
$NaMnO_4$	sodium permanganate
nm	nanometer
OC	organic carbon
OM	organic matter
P.I.	principal investigator
PO_4^{3-}	phosphate ion
SEM	scanning electron microscopy
SERDP	Strategic Environmental Research and Development Program
TCE	trichloroethylene
TDS	total dissolved solids
T_{max}	time of maximum absorbance (418nm measurements)
T_{min}	time of minimum absorbance (418nm measurements)
TOC	total organic carbon
TS	total solids
TSS	total suspended solids
um	micrometer
VR	vial reactor
wt.%	percent by weight
XG	xanthan gum

Figures and Tables

Acknowledgements

This work is supported wholly by the Department of Defense,
through the Strategic Environmental Research and Development Program (SERDP).

Executive Summary

In situ chemical oxidation (ISCO) using permanganate is an approach to organic contaminant remediation increasingly being applied at hazardous waste sites throughout the United States. Manganese dioxide (MnO_2) particles are products of the reaction of permanganate with organic contaminants and naturally-reduced subsurface materials. These particles are of interest because they have the potential to deposit in the subsurface and impact the flow regime in and around permanganate injection, including the well screen, filter pack, and the surrounding subsurface formation. The goal of this research is to understand the genesis and control of MnO_2 particles and to identify particle stabilization aids that will allow for their transport in groundwater through porous media under a variety of reaction conditions. Control of these particles can allow for improved oxidant injection, oxidant transport, and contact between the oxidant and contaminants of concern.

This project's specific objectives are to determine (1) if manganese dioxide particles can be stabilized/controlled in an aqueous phase to allow for transport through a solids phase, thereby inhibiting subsurface deposition, and (2) the dependence of stabilization and control of MnO_2 particles on porous media and groundwater characteristics. Bench-scale batch experiments to initially study important chemical interactions, followed by column studies to incorporate transport phenomena, were conducted to study particle stabilization aids under varied reaction matrix conditions. Variations include particle and stabilization aid concentrations, groundwater ionic content, pH, porous media type, and redox conditions.

Four stabilization aids were evaluated in the batch experiments for their ability to stabilize particles in solution over time and a range of groundwater conditions. The stabilization aid sodium hexametaphosphate (HMP) demonstrated the most promising results based on:

- Spectrophotometric studies of particle behavior
- Particle filtration results at varied pore sizes
- Optical measurements of particle size and zeta potential

HMP inhibited particle settling, provided for greater particle stability, and resulted in particles of a smaller average size over a range of pH, particle concentration, ionic content/strength, and oxidation/reduction potential (ORP) conditions compared to results for systems that did not include HMP. These results indicate that the inclusion of HMP in a permanganate oxidation system improves conditions that may facilitate particle transport.

Based on the favorable results in the batch scale experimentation, 1-D experimental transport studies were conducted to evaluate the impact of including HMP with delivery of permanganate to a nonaqueous phase liquid (NAPL) source zone within four different media types. Media types included sand-only, sand + 20% montmorillonite clay, sand + 1% goethite (FeO(OH)), and sand + 0.5% organic carbon. Particle transport through the media and retention of MnO_2 particles within the media were characterized following permanganate delivery with and without HMP. While particle retention and transport varied with specific media type, HMP consistently provided for significantly decreased particle retention and improved flow. With HMP, particle retention directly in the NAPL source zone decreased by 25% in sand media, 53% in sand + clay media, 85% in sand + goethite media, and 47% sand + organic carbon media.

Decreased particle retention with the use of HMP can allow for improved oxidant injection and transport, as well as contact between the oxidant and contaminants of concern. Improved oxidant delivery and flow translates to more efficient ISCO treatment, decreased potential for post-treatment contaminant rebound, and less reliance on invasive or expensive post-ISCO processes for treating contaminant residual.

Objectives

The primary technical objective of this research is to identify and evaluate a MnO_2 particle stabilization aid that will facilitate transport of manganese dioxide particles to avoid their deposition in well screens, filter packs, and in subsurface areas of high contaminant saturation. This will allow practitioners currently implementing permanganate injection and/or flushing technologies to maintain improved hydraulic control at a treatment site by amending oxidant solutions with the appropriate stabilization aid. Furthermore, the research will provide for greater understanding of the potential impacts of various porous media and groundwater characteristics on particle genesis, growth, and transport, in general, thereby improving the understanding of potential impacts in and around the zone of permanganate emplacement.

Background

Introduction

Manganese dioxide particles are a product of the reaction of permanganate with organic materials, including organic contaminants and natural organic matter. For example, Eqn. 1 demonstrates the reaction between permanganate and trichloroethylene (TCE), resulting in the generation of manganese dioxides solids.

$$2KMnO_4 + C_2HCl_3 \rightarrow 2CO_2 + 2\mathit{MnO_2} + 2K^+ + H^+ + 3Cl^- \qquad [1]$$

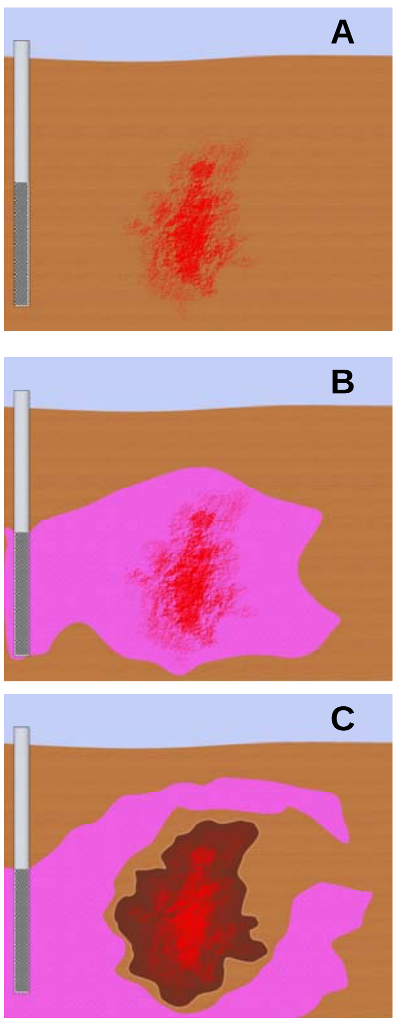
MnO_2 particles may deposit in the subsurface and impact the flow-regime in and around the zone of oxidant emplacement, thereby preventing effective oxidant distribution and contact with contaminants (e.g., Lee et al., 2003), as demonstrated in Figure 1. The goal of this research is to understand the genesis and control of MnO_2 particles and to identify particle stabilization aids that will allow for their transport in groundwater through porous media. Particle stabilization will inhibit deposition and resulting impacts on the flow regime, and will allow for improved oxidant delivery and contact with the contaminant. Further understanding is necessary, however, to test hypotheses: (1) manganese dioxide particles can be stabilized/controlled in an aqueous phase to allow for transport through a solids phase, thereby inhibiting subsurface deposition, and (2) the ability to stabilize and control MnO_2 particles is dependent on porous media and groundwater characteristics, including the porous media type, pH, particle concentration, oxidizing/reducing conditions, and ionic content.

Impacts of MnO_2 Deposition

Permeability changes may result due to MnO_2 particle deposition, which has been observed in some laboratory and field evaluations (e.g., West et al., 1998, 2000; Li and Schwartz, 2000; Lowe et al., 2000; Reitsma and Marshall, 2000; Lee et al., 2003), but not in others (e.g., Struse, 1999; Chambers et al., 2000a,b; Mott-Smith et al, 2000). It is postulated that differences observed in MnO_2 deposition and permeability effects are attributable to differences in natural and design conditions associated with these studies. The degree to which the particles can impact permeability appears to be related to the amount of contaminant in the reaction zone, as well as the reaction rate, which are interrelated. Table 1 presents a summary of laboratory and field evaluations where impacts of MnO_2 deposition have been observed and documented.

Characterization of MnO_2 Particles

Extensive characterization studies have been conducted by this project's P.I. to examine MnO_2 particles when generated under a variety of reaction matrix conditions (Crimi 2002, 2004a,b). Particle size studies, using both filtration and optical methods, verify that the particles resulting from permanganate oxidation with TCE are no larger than 0.41 um (lower detection limit of optical methods) under all conditions examined in these studies (varied reactant/particle concentrations, pH, extended reaction time periods (up to 6 months)); even where conditions favored a larger particle size (i.e., particle growth) such as the presence of calcium. Figure 2 presents particle size distribution results for representative samples included in these studies, while Figure 3 presents scanning electron microscopy (SEM) images of particles resulting from these same reaction conditions. After 600 hours, nearly all the Mn has formed particles that cannot pass the 0.1 micron filter, but essentially none of the particles can be detected by the optical method with a 0.41 micron detection limit.



A. Initial condition: areas of high subsurface residual contamination

B. Oxidant is introduced – initial contact between oxidant and contaminant is positive, some contaminant destruction is achieved

C. As oxidant continues to react with contaminant, manganese dioxide solids build up around areas of high saturation, favoring bypass of the oxidant around the contaminant residual, no further oxidation is achieved, high probability of contaminant rebound post-treatment

Figure 1. Conceptual Image of Potential Impacts of MnO_2 Deposition in the Subsurface Surrounding Areas of High Residual Contamination.

Table 1. Impacts of MnO_2 on Subsurface Permeability: Laboratory and Field Evaluations.

Study Description	Impacts of MnO_2	Reference
Field evaluation: A 5-spot recirculation network was employed to deliver 3000 mg/L $NaMnO_4$ to treat up to 600 mg/L TCE in groundwater. $NaMnO_4$ was added to contaminated groundwater above ground, filtered at 5 and 1 um respectively, then injected into a central injection well.	After approximately 5 days of operation, increasing injection well pressures (up to 18 psig) caused reduced recirculation rates (down to 4 gpm). Redevelopment of the injection well recovered the well efficiency, however increasing injection pressures and reduced recirculation rates were again rapidly observed.	Lowe et al., 2000
Field evaluation: 2-4 wt% of KMnO4 was used to treat TCE at 100 to 800 mg/L in groundwater.	Hydraulic conductivities measured 10 months after completion of the ISCO test showed order of magnitude decreases in several wells, especially the oxidant injection well.	West et al., 1998, 2000
Laboratory study: 1-D column and 2-D test cell studies were conducted to examine flushing efficiencies resulting from reaction of permanganate with typical aquifer materials containing dense nonaqueous phase liquid (DNAPL) contamination. The distribution of MnO_2 was evaluated.	The distribution of MnO_2 in column studies indicates that the majority of Mn was located close to or at the DNAPL zone. Precipitates tended to plug the column – flushing become more difficult as the experiment progressed. The 2-dimensional studies demonstrated flow bypass zones with high DNAPL saturation once the permanganate initially came into contact with the DNAPL. Contaminant removal efficiencies were less in 2D systems where flow was able to bypass areas with MnO_2 build-up.	Li and Schwartz, 2000
Laboratory study: 2-D experimental studies examined flow processes during DNAPL oxidation, with varying rates of reaction due to varied initial permanganate concentrations introduced to the system.	Substantial MnO_2 build-up was observed around the DNAPL emplacement zone. With lower initial permanganate concentration and slower reaction rates, more MnO_2 was deposited downgradient from the point of contact of oxidant with the DNAPL. Flow-regimes were impacted by the MnO_2 deposition.	Reitsma and Marshall, 2000
Laboratory study: 3-D experimental studies examined DNAPL contaminant destruction and MnO_2 deposition with treatment using 1250 mg/L $KMnO_4$.	The DNAPL oxidation process became less efficient with time, likely due to reduction in permeability caused by increasing MnO_2 deposition that inhibited contact between the permanganate and DNAPL. Large amounts of unreacted permanganate left the treatment zone during oxidant flushing.	Lee et al., 2003

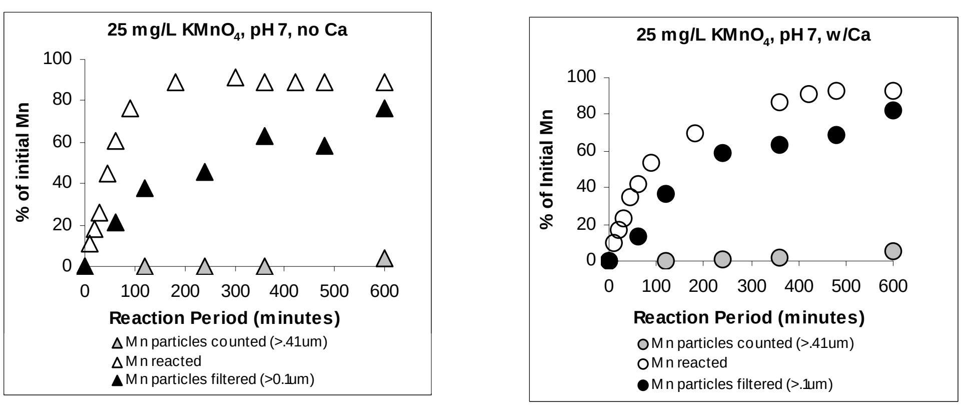


Figure 2. Particle Size Distribution for Samples Included in Manganese Dioxide Characterization studies. The Area Between White and Black Shapes = Particles < 0.10 um and Dissolved Mn, and the Area Between Black and Gray Shapes = Particles Between 0.10 and 0.41 um in Size. Six-month Reaction Period Sample Results Are Not Shown, But Are Similar to 600 min. Results (Crimi 2002).

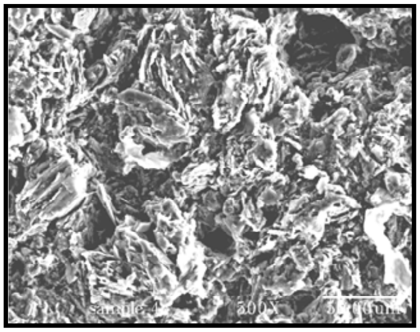
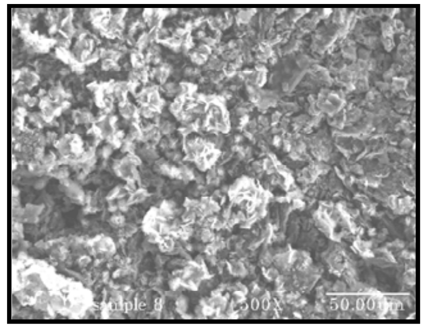
 **a.**  **b.**

Figure 3. SEM Images of Particles for Representative Samples Included in Figure 2; (a) Samples Without Calcium, and (b) Samples Containing Calcium (Crimi 2002).

The stability of these manganese dioxide particles in solution, which is an indicator of their potential to be controlled and transported with groundwater flow, can be impacted by several reaction matrix conditions. These include reactant/particle concentrations, pH, turbulence, and the presence of anions/cations in solution (Morgan and Stumm 1964; Perez Benito et al. 1989, 1990, 1991, 1992; Insausti et al. 1992, 1993; Doona and Schneider 1993; Chandrakanth and Amy 1996). Specifically, higher pH, high anion content, and the presence of stabilizing colloids can serve to maintain their stability in solution, providing a foundation for this proposed research. Exploratory studies conducted by this project's P.I have verified these influences, to some extent, and have provided for experimental and analytical designs tuned specifically for studying these effects (Figures 4-6) (Crimi 2002, 2004a,b). Additionally, a framework has been developed to assess the fate of manganese following permanganate ISCO based on extensive literature review (Table 2).

However, further research is necessary to explicitly determine if reaction conditions can be manipulated to stabilize and control manganese dioxide particles in groundwater to specifically allow for their facilitated transport through porous media. Since it is not particle size alone that will determine the ability of these particles to be transported, physico-chemical interactions must be considered and experimental studies need to be conducted to examine the interactions of potential stabilization aids (e.g., ionic/nonionic, organic/inorganic) with manganese dioxide particles, as well as the interactions of potential stabilization aids with porous media and groundwater. The ideal particle stabilizer will (1) interact minimally with porous media, (2) react minimally with the oxidant permanganate, (3) interact minimally with other groundwater components, (4) be acceptable to the regulatory community, and (5) be cost-effective.

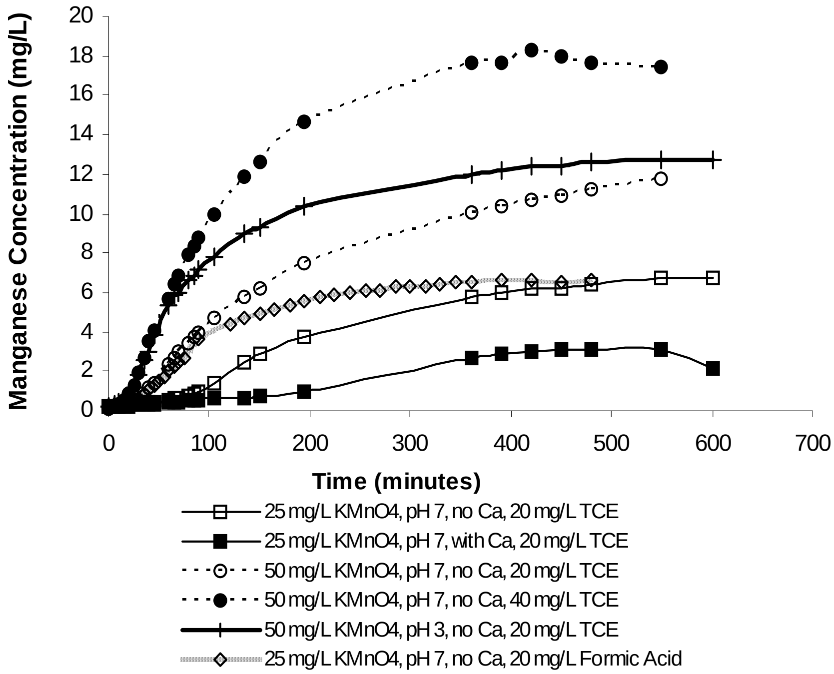


Figure 4. Manganese Oxides Generation and Particle Evolution Over Time for Representative Samples as Measured by Absorbance at 418 nm (and converted to Mn oncentration in manganese oxides form) Versus Time in Minutes.

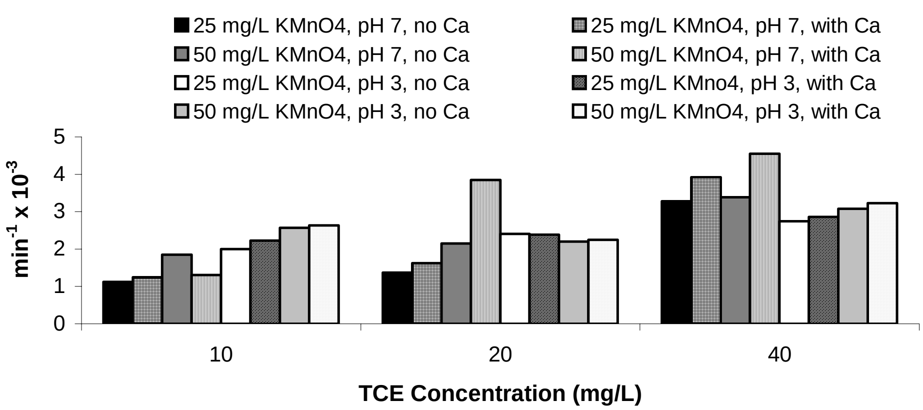


Figure 5. Particle Growth Rate From Primary, Soluble Particles to Suspended Particles Under Varied Matrix Conditions, as Determined via Spectrophotometric Methods Demonstrated in Figure 4.

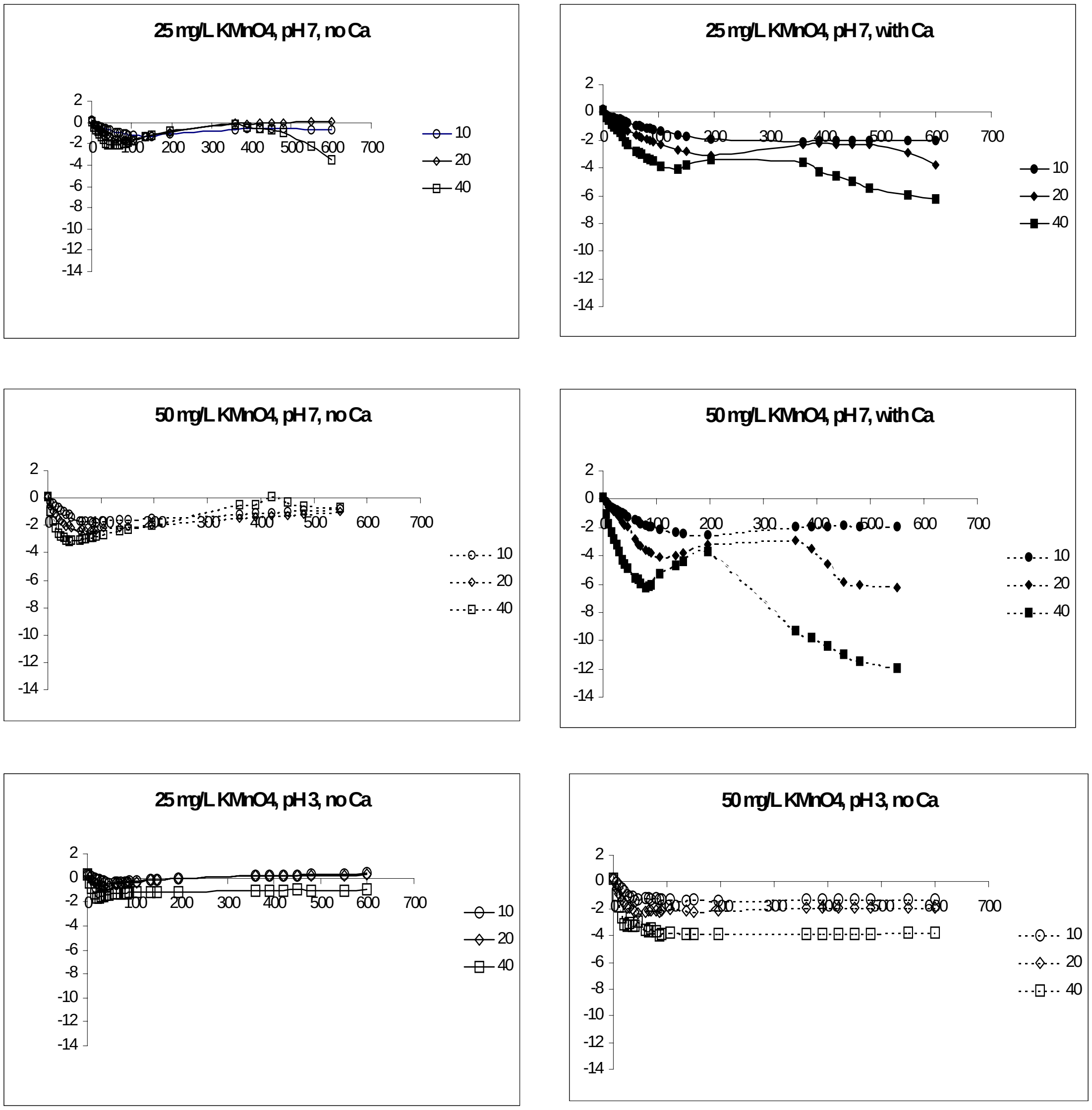


Figure 6. Deviations From Manganese Concentrations Expected Based on Permanganate Depletion Measurements at 525 nm Versus Time. The y-axis (δMn) is Calculated as the Difference Between Measured (418 nm) and Expected (525 nm) Manganese Concentrations (mg/L). The 10, 20, and 40 Designations in Each Chart's Key Indicate the Initial TCE Concentration in Solution (mg/L). A Negative δMn Value Demonstrates Detection of Less Manganese in the Form of Particles than Expected Based on the Quantity of Permanganate Depleted. Deviations From Expected Manganese Concentrations Can Be Attributed to (1) manganese present in a soluble and non-detectable form (measurable particles have not formed), (2) particle growth (agglomeration) and settling from the field of measurement, or (3) particle dissolution to Mn^{2+}. Overall, these Graphs Depict Three Trends With Respect to the Generated Particles. First, Each Sample Demonstrates an Initial Linear Decrease in δMn Over Time (particles are soluble and net yet detectable). Next, most Samples Show a Rise in This Value Approaching Zero (particle growth – suspended). Then, Some Samples Show a Subsequent Decline in Value (particle settling). A y-axis Value (δMn) of Zero at a Given point Would Indicate That all Permanganate was Converted to Manganese Oxides, and That the Manganese Oxides Were Stable in a Suspended Form in the Field of Measurement at That Point in Time.

Table 2. Framework for Assessing Manganese Fate During ISCO with Permanganate

Manganese Form		Conditions Promoting Form
Permanganate		❑ Permanganate introduced is in excess of available reductants ❑ Transport out of treatment region is slow
Mn-oxides	**Immobile**	❑ Oxidizing conditions - High Eh, High dissolved oxygen, Low reductant concentration, Abundance of Mn-oxidizing bacteria ❑ High pH ❑ High sorption of cations onto Mn-oxides ❑ Slow ground water flow
	Mobile	❑ Oxidizing conditions - High Eh, High dissolved oxygen, Low reductant concentration, Abundance of Mn-oxidizing bacteria ❑ Low pH ❑ High sorption of anions onto Mn-oxides ❑ High sorption of nonreactive colloids onto Mn-oxides ❑ Fast ground water flow
Mn^{2+}	**Immobile**	❑ Reducing conditions ❑ High pH ❑ High concentration of surface sorption sites ❑ Low competitive cation concentrations ❑ Slow ground water flow ❑ High carbonate concentration
	Mobile	❑ Reducing conditions ❑ Low pH ❑ Low concentrations of surface sorption sites ❑ High competitive cation concentrations ❑ Fast ground water flow

SERDP Relevance

A question associated with the delivery of treatment amendments to the subsurface, in general, is what impacts these amendments may have on natural subsurface flow conditions. This is especially the case with ISCO using permanganate where manganese dioxide solids, which may deposit in well screens and filter pack materials and within the subsurface formation, are a byproduct of the reaction with the contaminants of concern or naturally-reduced subsurface materials (natural organic matter, reduced minerals, etc.). Deposition of these particles in the well screen and/or filter pack can result in excessive back pressure and can inhibit delivery of oxidant to the subsurface. Deposition in the subsurface formation surrounding injection may cause preferential flow that bypasses these areas, which can prevent sufficient contact of oxidant with contaminant and limit treatment effectiveness. While the genesis and growth of these particles has been investigated at a fundamental level (e.g., Crimi and Siegrist, 2004b; Siegrist et al., 2002), no efforts to specifically evaluate the ability to control the growth and transport of manganese dioxide particles for favorable outcomes have been undertaken. These favorable outcomes include inhibiting particle deposition in well screens and filter packs in circulation-type permanganate injection systems (where permanganate is amended to contaminated groundwater above ground and is subsequently introduced to the subsurface via injection well), and inhibiting particle deposition in areas of high mass distributions of contaminants.

Materials and Methods

Approach

Table 3 presents an overview of the proposed research, incorporating motivation, objectives, hypotheses, experimental approach, and expected results and benefits.

Table 3. Overview of the Proposed Research.

Motivation	MnO_2 particles generated during in situ chemical oxidation using permanganate may impact the flow-regime in and around the zone of emplacement, thereby preventing effective oxidant distribution and contact with contaminants.
Hypotheses	1. Manganese dioxide particles can be stabilized/controlled in an aqueous phase to allow for transport through a solids phase, thereby inhibiting subsurface deposition, 2. The ability to stabilize and control MnO_2 particles is dependent on porous media and groundwater characteristics, including the porous media type, pH, particle concentration, oxidizing/reducing conditions, and ionic content.
Objectives	1. Investigate particle stabilization aids for optimal properties. 2. Examine particle transport through a variety of porous media types. 3. Partner optimum conditions for particle stabilization and particle transport in 1-D transport systems.
Approach	Task 1: Bench-scale batch experiments using 12-mL reaction vials to study MnO_2 stabilization aids. Task 2: 1-D transport experiments in columns (10-cm diam by 30-cm length) to study particle transport in varied porous media. Task 3: 1-D transport experiments in columns to study the partnering of stabilization, reaction, and transport.
Expected Results and Benefits	A manganese dioxide particle stabilization aid that will facilitate transport of MnO_2 particles to avoid potential loss of subsurface hydraulic conductivity attributable to particle deposition following in situ permanganate oxidation. Understanding of the potential impacts of various porous media and groundwater characteristics on particle transport.

Bench-scale, batch experimental systems were initially employed to assess important chemical interactions; then, experiments in larger 1-D columns follow to incorporate transport and reaction. Bench-scale systems focus on effects and interactions of (1) particle concentration, (2) stabilization aid concentration and type, (3) cations and anions in groundwater, (4) pH, (5) porous media solids, and (6) redox conditions (oxidant/reductant ratio). These conditions are also examined in larger-scale systems, which also incorporate influences of porous media type (organic carbon, clay, iron mineral content).

Primary analyses for batch studies focus on particle size and stability under the various conditions examined using spectrophotometric methods, with supporting filtration and optical measurement techniques. The primary analyses with respect to 1-D column studies focus on particle transport and retention.

General Materials

Oxidant. Potassium permanganate is the oxidant used to generate the manganese dioxide particles. Permanganate is increasingly employed at hazardous waste sites (US EPA 1998, Siegrist 1998) and its reactions have been studied extensively (along with particle genesis) (e.g., Case et al. 1997; Siegrist et al. 1999, 2000, 2001; Struse et al. 1999, 2002; Urynowicz 2000, Crimi 2002, 2003, 2004a,b). **Reductant.** The primary reductant used to generate the manganese dioxide particles is the contaminant trichloroethylene. It is a highly prevalent contaminant at hazardous waste sites where permanganate oxidation is applied, and its reactions with permanganate have been studied extensively (e.g., Case et al. 1997; Siegrist et al. 1999, 2000, 2001; Struse et al. 1999, 2002; Urynowicz 2000, Crimi 2002). **Aqueous Matrix.** A simulated groundwater matrix is employed, with an ionic strength of 0.01 and adjusted to pH 3 or pH 7 as appropriate. Ionic content varies, as appropriate for experimental design, in calcium content or in phosphate content to examine anionic and cationic impacts on system properties. **Solids Matrix.** The primary component of the solids matrix is a characterized medium sand with negligible silt and clay. Experimental variations in this matrix are provided through addition of organic carbon (OC) as a peat potting soil, iron oxides as goethite (FeO(OH)), and clay as a montmorillonite. **Stabilization Aids.** A review of the available literature with respect to particle stabilization has been conducted to choose 4 (organic/inorganic, ionic/nonionic) promising stabilization aids to meet the objectives of this study. This review focused on the food and pharmaceuticals industry in terms of non-toxic stabilizing additives, as well as catalysis literature in terms of stabilizing reactive colloids and avoiding reaction inhibition. Promising stabilization aids include polyphosphate (Perez-Benito and Arias 1991, Perez-Benito and Brillas 1992, Stumm 1992), anionic surfactants, and gum arabic and xanthan gum, which are water soluble food additives (Perez-Benito et al. 1990).

General Analytical Methods

Physical and chemical properties of aqueous phase samples, generated particles, and porous media solids are characterized using standard methods for solution and soils analysis, as outlined in Table 4. Appropriate sample replication, sample controls, and corroboration of sample methods were applied.

Table 4. Summary of Analytical Methods.

Property	General Method(s)	References
pH	Wet chemistry with electrode	APHA 1998, Klute et. al. 1986
Eh	Wet chemistry with electrode	APHA 1998
MnO_4^-	Spectrophotometry at 525 nm with Hach DR/4000	APHA 1998
TCE	H.P. 6890 Capillary GC-ECD/FID	US EPA 1986, 1990; APHA 1988
TOC	Elementar liquiTOC TOC/TN_b Analyzer	Sparks et al. 1996, APHA 1998
TS/TSS/TDS	Filtration and oven drying	APHA 1998
MnO_2 Quantification Behavior Size	 Sequential extraction and dissolution Spectrophotometry at 418 nm NICOMP 380 ZLS zeta potential/particle sizer	 Struse 1999, 2002 Crimi 2002
Soil particle size distribution	Hydrometer method	Klute et. al. 1986
pH_{pzc}	Titration	Blok and de Bruyn, 1970
Zeta potential	NICOMP 380 ZLS zeta potential/particle sizer	

Experimental Procedures

The experimental activities for this research are divided into three primary tasks: *(Task 1)* Bench-scale batch experiments using 12-mL reaction vials to evaluate stabilization aids; *(Task 2)* 1-D transport experiments in columns (2.5-cm diam by 60-cm length) to study particle transport in varied porous media, and *(Task 3)* 1-D transport experiments in columns to study the partnering of stabilization, reaction, and transport.

The objective of Task 1 is to investigate particle stabilization aids for optimal properties under a variety of reaction matrix conditions. Experimental studies were conducted in 12-mL reaction vials following a full factorial experimental design to investigate conditions presented in Table 5. Variation in particle concentration was provided by changing the initial concentrations of reactants in solution (permanganate and/or reductant). The two pH conditions encompass the ability of pH itself to impact particle behavior. Ionic variations were provided due to the ability of calcium and phosphate to impact particle behavior. Solids, for the purposes of these initial studies, consist of medium sand with little to no silt/clay fraction and organic carbon to examine simply the impact of the presence of solids on particle behavior. Different types of porous media content were examined in column studies in Task 2. Finally, prior to the initiation of Task 1, potential stabilization aids were selected as described above. A review of available literature indicated the potential promise of Dowfax 8390, sodium hexametaphosphate (polyphosphate or HMP), gum arabic, and xanthan gum for particle stabilization. Two concentrations of each stabilization aid were evaluated based on their solubility and/or ionic properties. All experiments were conducted in duplicate with appropriate sample controls.

Table 5. Experimental Conditions.

<table>
<tr><th>Variable</th><th colspan="5">Condition A</th><th colspan="5">Condition B</th><th colspan="6">Condition C</th></tr>
<tr><td>Particle concentration</td><td colspan="5">10 mg/L</td><td colspan="5">100 mg/L</td><td colspan="6">---</td></tr>
<tr><td>pH</td><td colspan="5">7</td><td colspan="5">3</td><td colspan="6">---</td></tr>
<tr><td>Ionic variation</td><td colspan="5">Base groundwater</td><td colspan="5">Base groundwater + Ca^{2+}</td><td colspan="6">Base groundwater + PO_4^{3-}</td></tr>
<tr><td>Solids content</td><td colspan="5">None</td><td colspan="5">20 wt. %</td><td colspan="6">---</td></tr>
<tr><td>Redox conditions</td><td colspan="5">1:1 initial ratio of MnO_4^- to reductant</td><td colspan="5">Oxidizing (excess MnO_4^-)</td><td colspan="6">Reducing (excess reductant)</td></tr>
<tr><td>Stabilization Aids</td><td colspan="4">Dowfax</td><td colspan="4">Polyphosphate</td><td colspan="4">Gum arabic</td><td colspan="4">Xanthan Gum</td></tr>
<tr><td>Stabilization Aid Concentration (mg/L)</td><td colspan="2">23,540</td><td colspan="2">3,300</td><td colspan="2">1,000</td><td colspan="2">100</td><td colspan="2">1,000</td><td colspan="2">100</td><td colspan="2">25</td><td colspan="2">10</td></tr>
</table>

Samples were prepared to encompass all conditions included in Table 5, except for the particles (or reactants) initially. They were then equilibrated, with agitation, in the dark at room temperature. At this point, particles (or reactants) were added to the systems to meet appropriate concentrations and analyses were initiated. Three stages of analysis were conducted as described below.

Spectrophotometric analyses. First, with one set of samples, spectrophotometric absorbance measurements at 418 nm were made at selected time points from the addition of particles to the system over a 72 hour reaction period. This provides a qualitative indication of particle size and stability in solution over time. Spectrophotometric measurements at 525 nm were also taken concurrently to examine changes in permanganate concentration over time.

Particle filtration. On a second set of samples, particles were sequentially filtered (polycarbonate membrane) at 5.0, 1.0, 0.40 and 0.10 μm, and the filtered particles were subjected to a three-phase sequential extraction (Struse 1999) at 2, 4, 8, and 24 hrs following the initiation of reaction. The filter membranes and retained solids were oven-dried at 103C for 2 hrs. and weighed to yield a dry mass of solids. Next, the solids were washed with deionized (DI) water, then with 0.10 M barium chloride to remove water-extractable and barium-exchangeable ions. Finally, the manganese dioxide particles were dissolved in 0.10 M hydroxylamine hydrochloride with 0.01 M nitric acid solution. Atomic absorption (AA) spectroscopy analyses for Mn content were made of the aqueous filtrate, the DI water extract, the barium chloride extract, and the acid dissolution solution to determine the degree of association of ions with the particles, and with the aqueous and solids phases. Absorbance measurements at 525 and 418 nm were taken both pre-filtration and following each filtration step, to determine the influence of the presence of MnO_2 particles on 525 nm permanganate measurements. This allows for quantification of manganese present as MnO_2 particles that were measured spectrophotometrically (i.e., calibration of 418 nm data).

Optical measurements. With a third set of samples, particles were examined by optical (laser) particle counting/sizing methods at selected reaction time points (2, 4, 8, 24 hrs). Samples were instrumentally measured for average particle size and zeta potential by electrophoretic light scattering of samples placed in an electric field on a NICOMP 380 ZLS zeta potential/particle sizer.

1-D transport experiments. Initial mini-column experiments were conducted as the first part of Task 2 transport experiments to determine the appropriate range in porous media conditions to evaluate in full scale transport experiments. The goal of the mini-column experiments was to identify environmentally relevant ranges of physical and chemical soil characteristics, by adding portions of clay, reactive mineral oxides, and organic carbon to a base sand media, which provide for a statistically significant difference in MnO_2 retention. Initial variations evaluated included 20% and 50% montmorillonite clay, 1 and 10% goethite (FeO(OH)), and 1 and 5% organic carbon as a peat potting soil.

The mini-column evaluations were conducted in 11 cm long columns with a diameter of 1.5 cm. The columns were packed with a coarse sand source zone (~0.5 cm), over which was wet-packed the mixed media of interest. First, the media were completely mixed in a mechanical shaker to facilitate even distribution of the material added to the base sand. Neat TCE (equal to the stoichiometric demand of TCE for the designed permanganate total mass plus the maximum mass that may be transported out of the source zone during pre-oxidation delivery based on solubility) was added to the source zone via syringe, then flow of 3.0-3.3 cm^3/hr was established in the column (upflow delivery) with a peristaltic pump using the base groundwater employed in Task 1. Five pore volumes of groundwater were delivered, followed by 2.5 pore volumes of 5,000 mg/L permanganate solution. Post-oxidation, an additional 5 pore volumes were delivered to re-establish baseline conditions. Column effluent was analyzed for total solids concentrations during each phase of flow. After the post-oxidation delivery phase, the columns were sectioned into 3 segments with distance from column influent. The 3-phase extraction described above for Task 1 particle filtration experiments was conducted with the media segments to quantify Mn

retained as MnO_2 in the columns. While there was no statistically significant difference in column total solids with media type, extraction results demonstrated statistically significant differences in MnO_2 retained in the columns with distance for all media variations evaluated. Based on these results, the conditions of 20% clay, 1% FeO(OH), and 0.5% organic carbon, along with the base sand condition, were selected for full-scale 1-D transport experiments. The clay and FeO(OH) conditions were the minimum values evaluated in the mini-column experiments, and the organic carbon condition was ½ the minimum value evaluated due to the considerable difference in MnO_2 retention between sand only and sand + 1% organic carbon measured in the mini-column experiments. The organic carbon exerted such an extensive demand for the permanganate that there was minimal transport of the permanganate through the media even with 2.5 pore volumes of oxidant delivery.

Following selection of the appropriate range of media conditions for the 1-D transport studies, the media were characterized as follows: (1) particle size, (2) soil pH, (3) Total organic carbon (TOC), (4) estimated point of zero charge pH (pH_{pzc}), and (5) zeta potential. Table 6 presents the media characteristics.

Full column experiments were next conducted with the characterized media in 60 cm long by 2.5 cm diameter glass columns. Like the mini-columns, the columns were packed first with a coarse sand (~2 cm) source zone, then wet-packed above with the media. Prior to injecting TCE via syringe to the source zone, tracer studies were conducted with bromide to characterize porosity differences (the primary expected response to differences in media physical characteristics). Once TCE was injected, column flow followed the same approach as for the mini-columns, with a delivery rate of 6.0 cm^3/hr and pre-, during-, and post-oxidant delivery of 5, 2.5, and 5 pore volumes, respectively. Again, simulated groundwater was used as the background solution, and the oxidant concentration was 5,000 mg/L. For each phase of solution delivery, column effluent was measured for pH, oxidation-reduction potential (ORP), total solids, total dissolved solids, permanganate concentration, and estimated MnO_2 concentration (using spectrophotometric methods and calibration curves established during Task 1). After completion of the flow-through conditions, columns were sectioned into 12 segments with distance from influent, and the 3-phase extraction was performed on each of the segments to quantify MnO_2 retained in the columns. Next, to meet Task 3 objectives, each column test was repeated with the addition of 1,000 mg/L of the stabilization aid hexametaphosphate (HMP) to the permanganate delivery solution, which was determined during Task 1 experiments to be the most promising MnO_2 stabilization aid of those evaluated in these studies.

Table 6. Characteristics of Media Used in 1-D Transport Experiments

Media	Avg. Particle Size (mm)	d_{10} (mm)	d_{60}/d_{10}	Soil pH	TOC (wt. %)	pH_{pzc}	Zeta potential (mV)
Sand only	0.45	0.185	2.43	4.93	0.017%	<2.5	- 17.35
Sand + 1% FeO(OH)	0.56	0.195	3.69	5.56	< 0.01%	<2.25	- 19.52
Sand + 0.5% organic carbon	0.42	0.18	3.11	5.31	0.498 %	<2.75	- 20.67
Sand + 20% clay (montmorillonite)	0.30	0.05	9.0	2.21	< 0.01%	<2.25	- 1.66

Data Analysis

Spectrophotometric analyses. First, using the filtration data generated with the second set of samples described above, correction factors were calculated to correct the spectrophotometric measurements at 525 nm. The manganese dioxide particles interfere with measurements of absorbance (used to calculate permanganate concentration) at this wavelength. Measurements at 418 nm and 525 nm before and after filtration allow for correction of the 525 nm data. Furthermore, by analyzing the data between each filtration step, it is possible to determine the influence of differently sized particles on the correction factor. Equation 2 is applied to correct the 525 nm data. The correction factor was calculated using equation 3.

$$A_{525,\text{actual}} = A_{525,\text{measured}} - (A_{418,\text{measured}} \text{ x correction factor}) \qquad [2]$$

$$\text{Correction factor} = \frac{(A_{525} \text{ pre-filtration} - A_{525} \text{ post-filtration})}{(A_{418} \text{ pre-filtration} - A_{418} \text{ post-filtration})} \qquad [3]$$

Differences in the correction factors calculated for each experimental condition indicate differences in particle light scattering characteristics, which is further indicative of structural differences in individual particles or the particle agglomerates.

Once 525 nm spectrophotometric data were corrected, they were used to evaluate differences in particle generation rates under the varied reaction conditions and to determine if the stabilization aids exerted a demand for (i.e., reacted with) the permanganate. An ideal stabilization aid will not exert a demand for the oxidant. These analyses were made by first converting expended permanganate concentrations (initial permanganate concentration minus measured permanganate concentration) to equivalent concentrations of Mn as MnO_2. These results were graphed vs. time (see Results and Accomplishments), and examined for differences in particle generation rates (i.e., reaction kinetics) and extents (i.e., a greater extent of reaction with a stabilization aid present vs. extent with no stabilization aid present indicates the aid exerts a demand for the oxidant).

Next, the 418 nm data were assessed for multiple responses. Because the 418 nm data reflect the measurement of particles suspended in solution, they provide a qualitative indication of particle behavior. An increase in the 418 nm measurements indicates an increasing concentration of suspended particles, whereas a decrease indicates particles have settled from solution. An ideal stabilization aid will prevent particle settling. Responses measured using the 418 nm data include (1) maximum absorbance value (Amax), (2) time of maximum absorbance (Tmax), (3) time of maximum absorbance minus time of minimum absorbance (Tmax-Tmin), and (4) particle settling rate ($k_{s\text{-}obs}$) (Figure 7). A higher maximum absorbance value indicates a higher concentration of particles suspended in solution. Tmax and Tmax-Tmin characterize the particle growth and settling behavior. Favorable particle stabilization is indicated by a highly positive value for the Tmax-Tmin, corresponding with a relatively late Tmax value in general (i.e., particles are suspended for a longer duration). Particle settling rates were calculated by fitting the 418 nm data after the reaction between oxidant and reductant was complete (~4 hours) to a power curve; $y = Ax^B$, where y is absorbance at 418 nm, x is time, A and B are model fitting parameters,and B provides the rate of particle settling in terms of decreasing 418 nm absorbance vs. time.

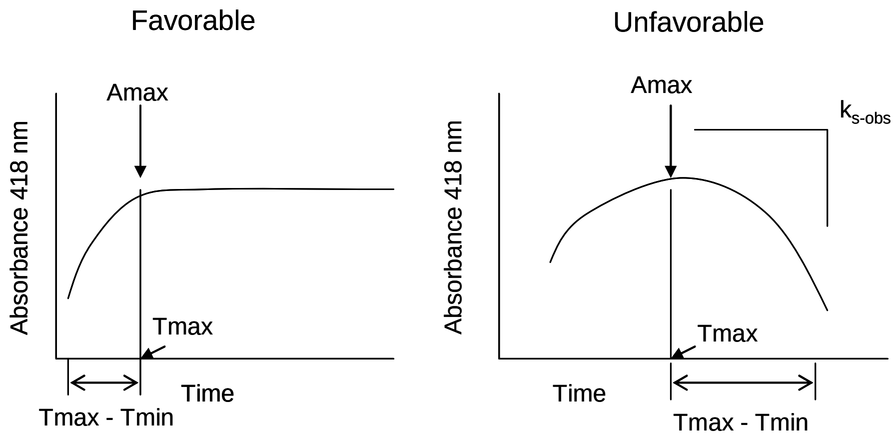


Figure 7. Demonstration of 418 nm Response Metrics.

These values were statistically assessed using Minitab 14 for main effects and interactions of reaction variables. Minitab was employed to discern the range of values for each of the responses listed above for each of the stabilization aids and the "no stabilization" condition. Additionally, the statistical significance for the impact each reaction variable (Table 5) on the responses was determined. An ideal stabilization aid will decrease the influence of varying groundwater conditions (i.e., pH, ionic content, etc.) on particle behavior while offering improved particle stability in solution.

Particle filtration. Particle filtration data were analyzed for particle size distribution at each time point measured. For particles retained on each the 5.0, 1.0, 0.40 and 0.10 μm filters, Mn as MnO_2 was quantified using AA as described above. To quantify the < 0.10 μm-sized particles, first all reacted permanganate (determined via spectrophotometric measurements as described above) was converted to Mn as MnO_2 (total MnO_2). A limitation to this approach is the assumption that all reacted permanganate is converted to MnO_2, which is a reasonable assumption given Equation 1 holds true for the pH range of ~3-12. Next, the total mass of MnO_2 collected on each of the filters was summed and subtracted from the total MnO_2 value. The remainder is assumed to be the < 0.10 μm fraction of particles.

Next, the change in 418 nm absorbance values from filtration measured spectrophotometrically before and after each filtration step were correlated to the Mn as MnO_2 mass quantified via dissolution and AA analysis to create a calibration of absorbance vs. Mn mass for each reaction system. The calibrated values were used to convert all 418 nm data measured during spectrophotometric tests to Mn as MnO_2 particles suspended in solution over time. These data provide information regarding whether a solution containing a stabilization aid (1) results in a greater concentration suspended of particles over time, (2) inhibits particle settling over time, and/or (3) results in a lower concentration of particles reaching a size range (~0.1 μm) that can even be detected via spectrophotometric methods.

Optical measurements. The average particle size and zeta potential measurement data were assessed graphically for trends with respect to time for each stabilization aid and were compared

to the “no stabilization aid” condition. Data were assessed for conditions that result in statistically significant differences in particle size and zeta potential.

1-D transport experiments. The primary analysis of the 1-D transport experiments was a mass balance performed on the manganese introduced to the columns (initially as permanganate), separated as Mn exiting the column (as MnO_4^- or MnO_2) and Mn retained in the column (as water- or Ba-extractable Mn or as MnO_2). These data were assessed for trends with respect to soil and groundwater conditions (e.g., pH, ORP, pH_{pzc}, particle size, and zeta potential). Results were compared for columns with and without introduction of HMP with the permanganate solution.

Results and Accomplishments

Spectrophotometric Analyses

Table 7 presents the correction factors determined during particle filtration that were employed to correct the 525 nm absorbance values for permanganate concentration measurement. Figure 8 provides example data for corrected 525 nm data vs. time, representing permanganate depletion and MnO_2 generation rate and extent. Representative data are presented here due to the numerous samples (586 runs in duplicate) processed as a function of the full factorial experimental design. Appendix I includes a key of sample constituents for samples measured via spectrophotometric methods. Appendix II contains the full set of the uncorrected 525 nm data. Appendix III includes the average rate constant (observed pseudo 1^{st}-order) values calculated for permanganate depletion for each sample run.

Table 7. Correction Factors for 525 nm Measurements due to Particle Interference.

ID	GW	pH	Stabilization	$KMnO_4$	TCE	525 correction 525A = 525M - 418M(x) X
1	Base	3	none	500uL 1818mg/L	450uL 840mg/L	0.87
2	Base	3	1a	500uL 1818mg/L	450uL 840mg/L	0.44
3	Base	3	1b	500uL 1818mg/L	450uL 840mg/L	0.44
4	Base	3	2a	500uL 1818mg/L	450uL 840mg/L	7.70
5	Base	3	2b	500uL 1818mg/L	450uL 840mg/L	1.00
6	Base	3	3a	500uL 1818mg/L	450uL 840mg/L	0.20
7	Base	3	3b	500uL 1818mg/L	450uL 840mg/L	0.06
8	Base	3	4a	500uL 1818mg/L	450uL 840mg/L	0.38
9	Base	3	4b	500uL 1818mg/L	450uL 840mg/L	0.30
10	Base	7	none	500uL 1818mg/L	450uL 840mg/L	0.93
11	Base	7	1a	500uL 1818mg/L	450uL 840mg/L	0.56
12	Base	7	1b	500uL 1818mg/L	450uL 840mg/L	0.41
13	Base	7	2a	500uL 1818mg/L	450uL 840mg/L	0.00
14	Base	7	2b	500uL 1818mg/L	450uL 840mg/L	0.55
15	Base	7	3a	1mL 364mg/L	180uL 840mg/L	0.63
16	Base	7	3b	1mL 364mg/L	180uL 840mg/L	0.48
17	Base	7	4a	1mL 364mg/L	180uL 840mg/L	0.67
18	Base	7	4b	1mL 364mg/L	180uL 840mg/L	0.67
19	Ca	3	none	500uL 1818mg/L	450uL 840mg/L	0.92
20	Ca	3	1a	500uL 1818mg/L	450uL 840mg/L	0.57
21	Ca	3	1b	500uL 1818mg/L	450uL 840mg/L	0.88
22	Ca	3	2a	500uL 1818mg/L	450uL 840mg/L	0.66
23	Ca	3	2b	500uL 1818mg/L	450uL 840mg/L	1.00
24	Ca	3	3a	1mL 364mg/L	180uL 840mg/L	0.13
25	Ca	3	3b	1mL 364mg/L	180uL 840mg/L	0.45
26	Ca	3	4a	1mL 364mg/L	180uL 840mg/L	0.45
27	Ca	3	4b	1mL 364mg/L	180uL 840mg/L	0.32
28	Ca	7	none	500uL 1818mg/L	450uL 840mg/L	0.89
29	Ca	7	1a	500uL 1818mg/L	450uL 840mg/L	0.48
30	Ca	7	1b	500uL 1818mg/L	450uL 840mg/L	0.49
31	Ca	7	2a	500uL 1818mg/L	450uL 840mg/L	0.26
32	Ca	7	2b	500uL 1818mg/L	450uL 840mg/L	0.72
33	Ca	7	3a	1mL 364mg/L	180uL 840mg/L	0.96
34	Ca	7	3b	1mL 364mg/L	180uL 840mg/L	0.89
35	Ca	7	4a	1mL 364mg/L	180uL 840mg/L	0.69
36	Ca	7	4b	1mL 364mg/L	180uL 840mg/L	0.56
37	PO4	3	none	500uL 1818mg/L	450uL 840mg/L	1.17
38	PO4	3	1a	500uL 1818mg/L	450uL 840mg/L	0.31
39	PO4	3	1b	500uL 1818mg/L	450uL 840mg/L	0.40
40	PO4	3	2a	500uL 1818mg/L	450uL 840mg/L	16.70
41	PO4	3	2b	500uL 1818mg/L	450uL 840mg/L	1.26
42	PO4	3	3a	1mL 364mg/L	180uL 840mg/L	0.45
43	PO4	3	3b	1mL 364mg/L	180uL 840mg/L	0.38
44	PO4	3	4a	1mL 364mg/L	180uL 840mg/L	0.60
45	PO4	3	4b	1mL 364mg/L	180uL 840mg/L	0.44
46	PO4	7	none	500uL 1818mg/L	450uL 840mg/L	1.07
47	PO4	7	1a	500uL 1818mg/L	450uL 840mg/L	0.55
48	PO4	7	1b	500uL 1818mg/L	450uL 840mg/L	0.56
49	PO4	7	2a	500uL 1818mg/L	450uL 840mg/L	7.45
50	PO4	7	2b	500uL 1818mg/L	450uL 840mg/L	0.80
51	PO4	7	3a	1mL 364mg/L	180uL 840mg/L	1.17
52	PO4	7	3b	1mL 364mg/L	180uL 840mg/L	1.14
53	PO4	7	4a	1mL 364mg/L	180uL 840mg/L	0.63
54	PO4	7	4b	1mL 364mg/L	180uL 840mg/L	0.92

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

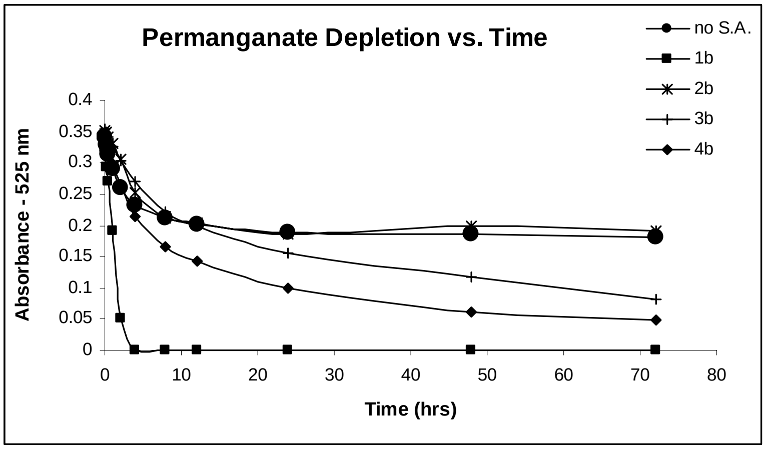


Figure 8. Representative data for 525 nm measurements (to determine permanganate concentration) vs. time. "No S.A." refers to no stabilization, "1b" refers to Dowfax, "2b" is polyphosphate, "3b" is gum arabic, and "4b" is xanthan gum. All samples are for the base groundwater condition at pH 3 with no solids present, and equimolar oxidant and reductant.

Appendix IV contains the raw data for the 418 nm measurements (which did not require interference correction for the presence of permanganate or for the stabilization aids), and Appendix V includes the key response values determined (Amax, Tmax, Tmax-Tmin, $k_{s\text{-}obs}$) from the 418 nm data. Table 8 summarizes the range of values determined via Minitab for the responses for each stabilization aid, along with the statistical significance (i.e., p-value) for each for the reaction system variables' influence on the responses. A p-value of < 0.1 for these studies is considered to be statistically significant.

Table 8. Range of Response Values and Statistical Significance of Reaction Variables.

	P values						Range
		Variables					
	Response	conc	pH	GW	solids	redox	
no stabilization	Tmax (hrs)	0.000	0.009	0.016	0.000	0.004	2 - 8
	Amax (Abs)	0.000	0.108	0.001	0.456	0.113	0.2 - 1.2
	Tmax-Tmin (hrs)	0.001	0.306	0.624	0.002	0.002	-71 - -50
	$k_{s\text{-}obs}$*	0.000	0.012	0.000	0.942	0.097	0.75 - 1.02
Dowfax	Tmax (hrs)	0.000	0.000	0.674	0.642	0.540	1 - 21
	Amax (Abs)	0.000	0.715	0.000	0.255	0.050	0.5 - 3.2
	Tmax-Tmin (hrs)	0.000	0.000	0.893	0.821	0.912	-71 - -30
	$k_{s\text{-}obs}$*	0.000	0.000	0.893	0.821	0.912	0.5 - 1.10
Poly-phosphate	Tmax (hrs)	0.000	0.000	0.022	0.093	0.313	10 - 40
	Amax (Abs)	0.000	0.587	0.000	0.758	0.000	0.3 - 2.0
	Tmax-Tmin (hrs)	0.000	0.000	0.002	0.012	0.438	-20 - +10
	$k_{s\text{-}obs}$*	0.000	0.005	0.001	0.548	0.678	0.1 - 0.7
Gum Arabic	Tmax (hrs)	0.123	0.000	0.003	0.856	0.012	20 - 44
	Amax (Abs)	0.000	0.166	0.000	0.754	0.000	1.0 - 3.6
	Tmax-Tmin (hrs)	0.000	0.000	0.006	0.908	0.063	5 - 38
	$k_{s\text{-}obs}$*	0.137	0.000	0.291	0.693	0.382	-0.1 - +0.4
Xanthan Gum	Tmax (hrs)	0.000	0.000	0.000	0.969	0.015	10 - 58
	Amax (Abs)	0.000	0.002	0.000	0.707	0.333	0.7 - 3.4
	Tmax-Tmin (hrs)	0.000	0.000	0.000	0.984	0.302	-50 - +55
	$k_{s\text{-}obs}$*	0.000	0.000	0.407	0.928	0.403	0.15 - 0.8

*NOTE: A positive $k_{s\text{-}obs}$ value, as applied here, indicates particle settling has occurred during the 72 hour reaction period, whereas a negative $k_{s\text{-}obs}$ value indicates particle growth continues through reaction. A higher value for B (positive or negative) indicates a faster rate of settling/growth.

Particle Filtration

Figure 9 presents the full set of particle size fraction data from filtration experiments at the 24 hour reaction period for all sample conditions. The full data set is included in Appendix VI for all time periods examined, including additional data figures. A particle size of < 0.10 μm is the most desirable result. This is shown as the white segment of each bar in the Figure 9 chart. For quick interpretation, the "least favorable" conditions have an overall darker shaded bar, and the "most favorable" conditions have an overall lighter, or white, shaded bar.

As mentioned, the filtration data along with changes in 418 nm absorbance with each step of filtration, were used to convert all collected spectrophotometric data to MnO_2 concentrations suspended in solution. These data were examined graphically to (1) confirm particle settling rates estimated from change in absorbance vs. time, (2) compare stabilization aids' ability to maintain particles suspended in solution over time (i.e., inhibition of particle settling), and (3) compare the maximum suspended particle concentration in solution to the maximum possible suspended particle concentration (based on permanganate concentrations). In interpreting results with respect to the latter objective, it is important to consider that differences between concentrations of particles suspended in solution and the maximum possible suspended concentration can result from two causes: (A) particles have settled from solution and are no longer in the spectrophotometer detection field (unfavorable particle condition indicative of large, settleable particles), or (B) particles are below the spectrophotometer detection limit, where the particles are too small to effectively scatter light (favorable particle condition indicative of very small, dissolved or suspended particles). For appropriate interpretation, the suspended particle concentration data must be considered side-by-side with particle filtration data to determine if results relate to cause (A) or cause (B). Figure 10 shows representative data for the suspended MnO_2 particle mass over time in solution. Appendix VII contains graphs derived from all data.

Optical Measurements

Figure 11 shows representative data for particle size measurements for pH 7, equimolar oxidant and reductant, with and without solids present conditions at the 24 hour reaction period. Low and high particle concentration samples are presented. Figure 12 shows representative data for zeta potential measurements, which are also for pH 7, equimolar oxidant and reductant, with and without solids present conditions at the 24 hour reaction period. Appendix VIII contains the complete data sets, with additional figures illustrating the data. The profile of conditions that result in statistically significant differences in particle size and zeta potential are quite similar to those presented in Table 8, confirming that these measurements are viable indicators of particle behavior.

1-D Transport Experiments

Mini-column experiments were first conducted to determine an appropriate range in media characteristics to employ in the full-scale 1-D transport experiments. Results of measurements for Mn retention in these range-finding experiments demonstrated that variations to the base sand media of 20% clay, 1% goethite (FeO(OH)), and 0.5% organic carbon would provide, at the full-scale, measurable and statistically-significant differences in permanganate depletion and MnO_2 deposition, while being representative of field-like conditions. Appendix IX contains representative results for these initial range-finding experiments.

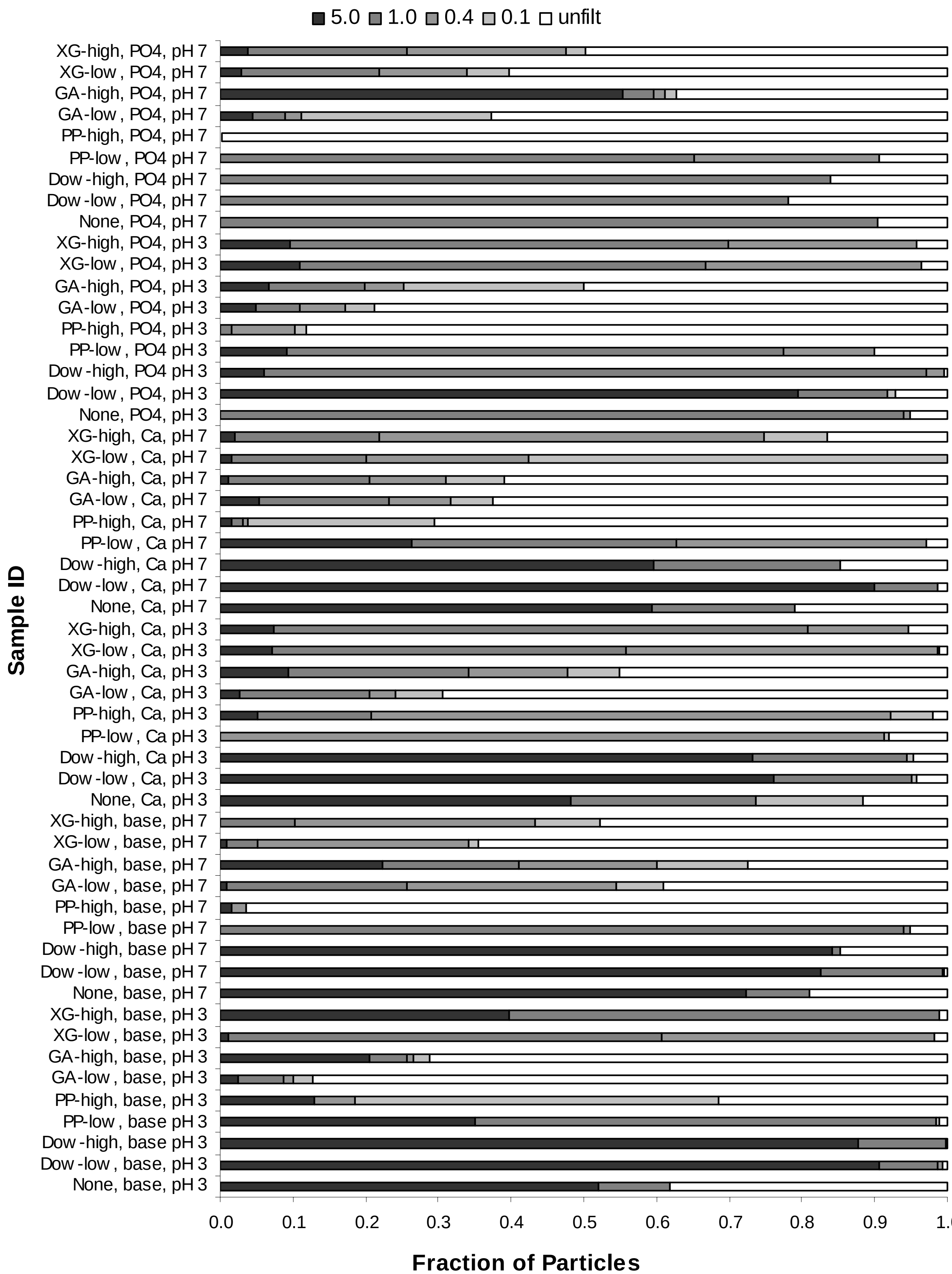


Figure 9. Particle Size Fractions For All Sample Conditions at the 24-hour Reaction Period. The White Bar Segment Represents the "most favorable condition", or the Size Fraction <0.10 μm.

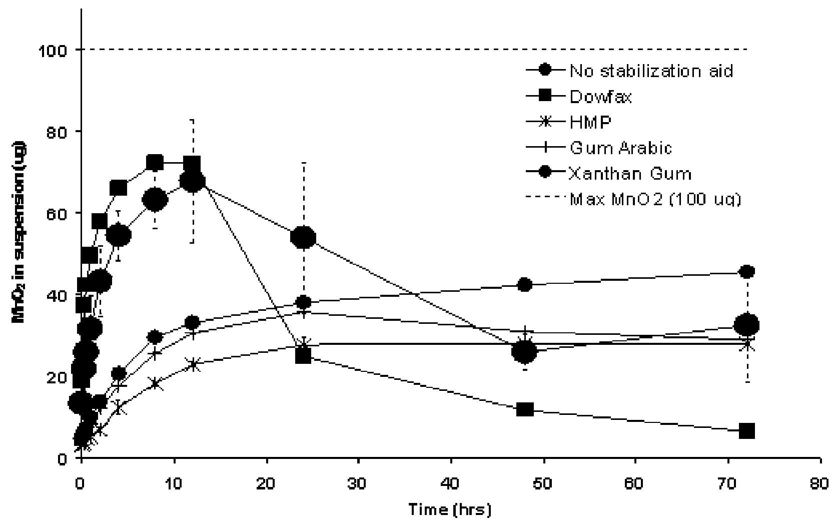


Figure 10. Mass of MnO_2 Suspended in Solution over 72-hour Reaction Period For Each Stabilization Aid Condition For Representative Conditions of Base GW, pH 7, Equimolar Oxidant and Reductant Present, Without Solids Present.

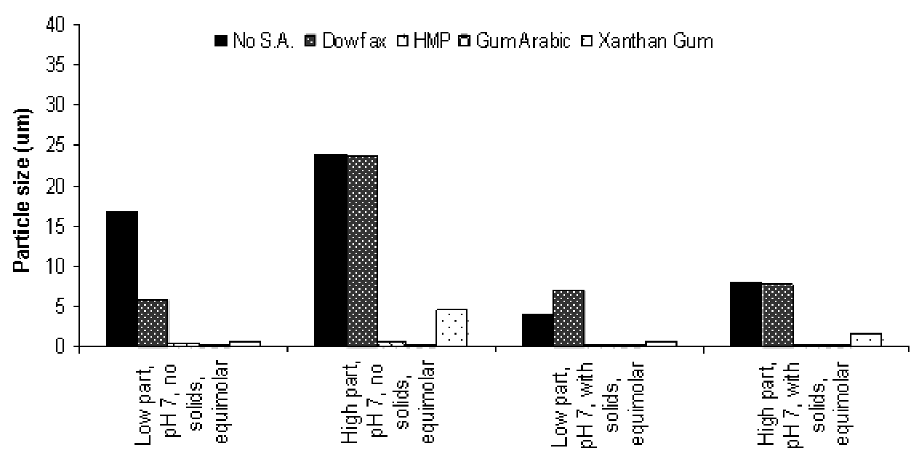


Figure 11. Average Particle Size For Each Stabilization Aid Condition at pH 7, Equimolar Oxidant and Reductant Present, With and Without Solids Present. Low and High Particle Concentration Samples Are Presented.

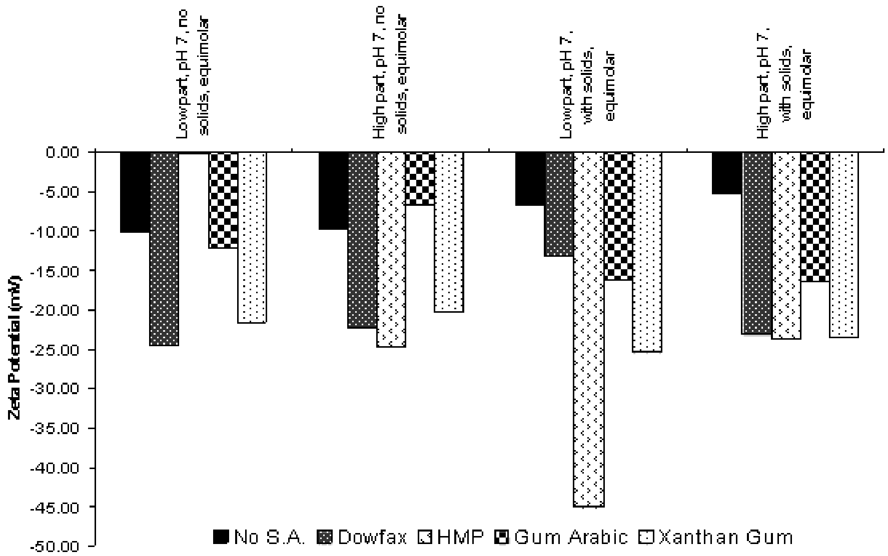


Figure 12. Zeta Potential For Each Stabilization Aid Condition at pH 7, equimolar oxidant and Reductant Present, With and Without Solids Present. Low and High Particle Concentration Samples Are Presented.

Transport studies without the use of stabilization aids. Full-scale 1-D experiments were conducted first without addition of stabilization aids to characterize the influence of the media type on MnO_2 deposition/retention. Analysis of the tracer data indicate that of the four media types evaluated, the media containing 20% clay had a faster flow rate (~12%) than the other three media types. This is likely due to the smaller particle size and larger uniformity coefficient (Table 6), thus smaller porosity of this media. Influent was delivered from a common pump with four pump heads, and it was confirmed that there were no differences in the influent delivery rate.

The primary data analysis was to perform a mass balance on the Mn introduced to the columns as permanganate. Table 9 summarizes results as the % Mn as each primary species either exiting or retained in the column. It is assumed that the Mn^{2+} (dissolved) species is not present in column effluent. If there is Mn^{2+} present, it is lumped into the MnO_2-effluent term in Table 9. Mn-effluent as MnO_2 was measured using the spectrophotometric method (418 nm) and calibration as MnO_2 developed during Task 1. Mn-effluent as MnO_4^- was also measuring using the spectrophotometric method (525 nm). Total Mn-retained was calculated by subtracting total Mn-effluent from total Mn introduced to the column. Because column extractions were performed on a small portion of each column segment, extrapolating these values to the total mass of media in the respective segment over-estimated total Mn-retained; thus these values were calculated as described.

Table 9. Percent of Mn Introduced to Columns as Each Species

	Species	Sand	Sand + 1% FeO(OH)*	Sand + 0.5% organic carbon	Sand + 20% Clay*
Mn-effluent	as MnO_4^-	42.2%	0%	0%	0%
	as MnO_2	1.4%	0%	1.8%	0%
Mn-retained	as DI-extractable Mn	0.9%	1.4%	0.9%	0.6%
	as BaCl-extractable Mn	0.8%	1.4%	1.6%	5.0%
	as MnO_2	54.8%	97.2%	95.7%	94.4%

*These columns completely plugged after ~1 PV of oxidant delivery.

Figure 13 shows particle deposition (Mn-retained as MnO_2 fraction from Table 9) within the 1-D columns by media type and by distance from column influent. The values presented are normalized for the mass of permanganate actually delivered to the column. Two columns, sand + clay and sand + goethite, both experienced completely blocked flow within one pore volume of delivery, whereas the sand only and sand + organic matter columns accepted the full 2.5 pore volumes of the design delivery volume. Note that the majority of particle deposition, for all media types, occurs within the first several centimeters of the column, concentrated in the NAPL source zone (each section corresponds with 5 cm column length).

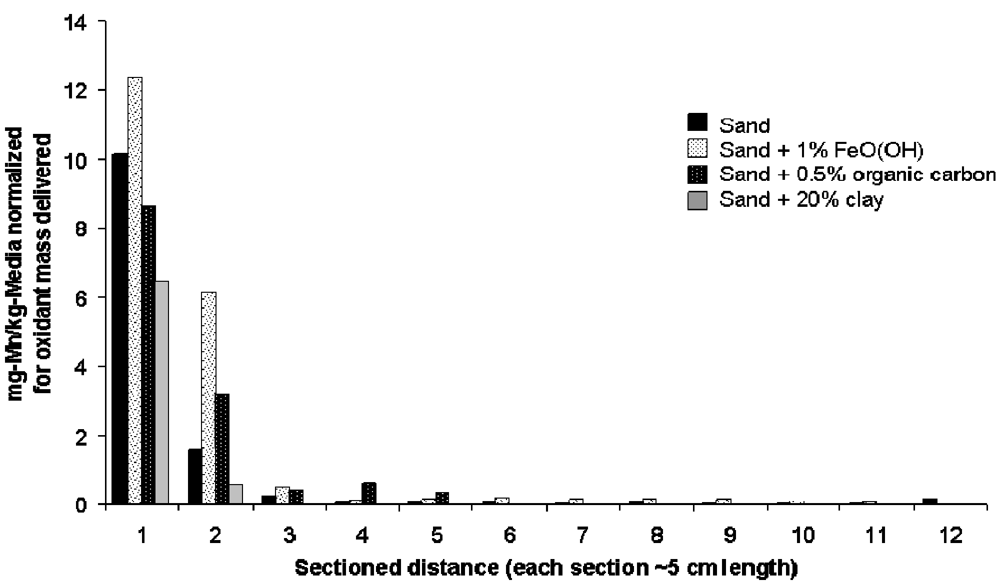


Figure 13. Mass of Mn (as MnO_2) per kg of Media With Distance From 1-D Column Influent. Trichloroethylene NAPL is Located Within Section 1. Each Section is Approximately 5 cm of Column Length. Results are Normalized For the Total Mass of Permanganate Delivered to the column. Delivery Mass Differed for Columns Due to Plugging and Restricted Flow in Sand + Goethite and Sand + Clay Columns.

Total solids concentrations, shown in Figure 13, as well as dissolved and suspended fractions thereof, were measured for each quarter pore volume of column effluent. Solids concentrations were > 99% dissolved solids, and, as demonstrated in Table 9 Mn-effluent data, were low in concentration.

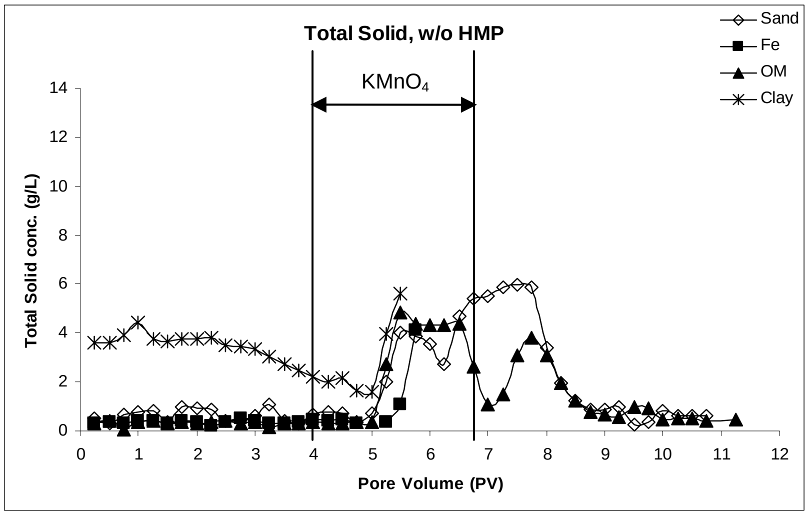


Figure 14. Total Solids Concentration in Column Effluent With Volume of Solution Delivered.

Total solids concentrations above background levels may be attributable to solids as dissolved MnO_4^-, or as dissolved MnO_2. It is interesting to note that increases in total solids concentrations in each of the columns occurs after approximately one pore volume of oxidant delivered, however, as Table 9 shows, little to no permanganate or MnO_2 were detected in any of the columns except for permanganate in the sand column. It is likely that the increases are primarily attributable to increases in dissolved MnO_2 concentrations, but that these particles are below the detection limit (i.e., ~ 0.1 μm) of the spectrophotometric measurement method.

Figure 15 shows column effluent pH and oxidation-reduction potential (ORP) for each column conducted without stabilization aid. Again, note that less volume was passed through columns containing clay and iron due to plugging at ~ 1 PV of oxidant delivery. As anticipated, column pH decreases significantly during the oxidant delivery phase due to H^+ generated during permanganate reaction with TCE and the very low buffering capacity of the background groundwater. Note that the clay-containing media has a lower initial pH due to the low pH of the media itself (Table 6). Corresponding with the drop in pH is an anticipated increase in ORP due to the oxidizing conditions introduced. While iron-containing and clay-containing columns have no interpretable post-oxidation data due to column plugging and restricted flow, it is interesting to note the differences between the sand-only and the sand + 0.5% organic carbon column. The sand-only column returns to pre-oxidation conditions very soon after oxidant delivery ceases. The organic carbon-containing column, however, has a significantly increased pH (above baseline) and decreased ORP (below baseline). It is likely that low molecular weight organic acids are generated due to oxidation of the organic carbon in the porous media, which are contributing to these effects.

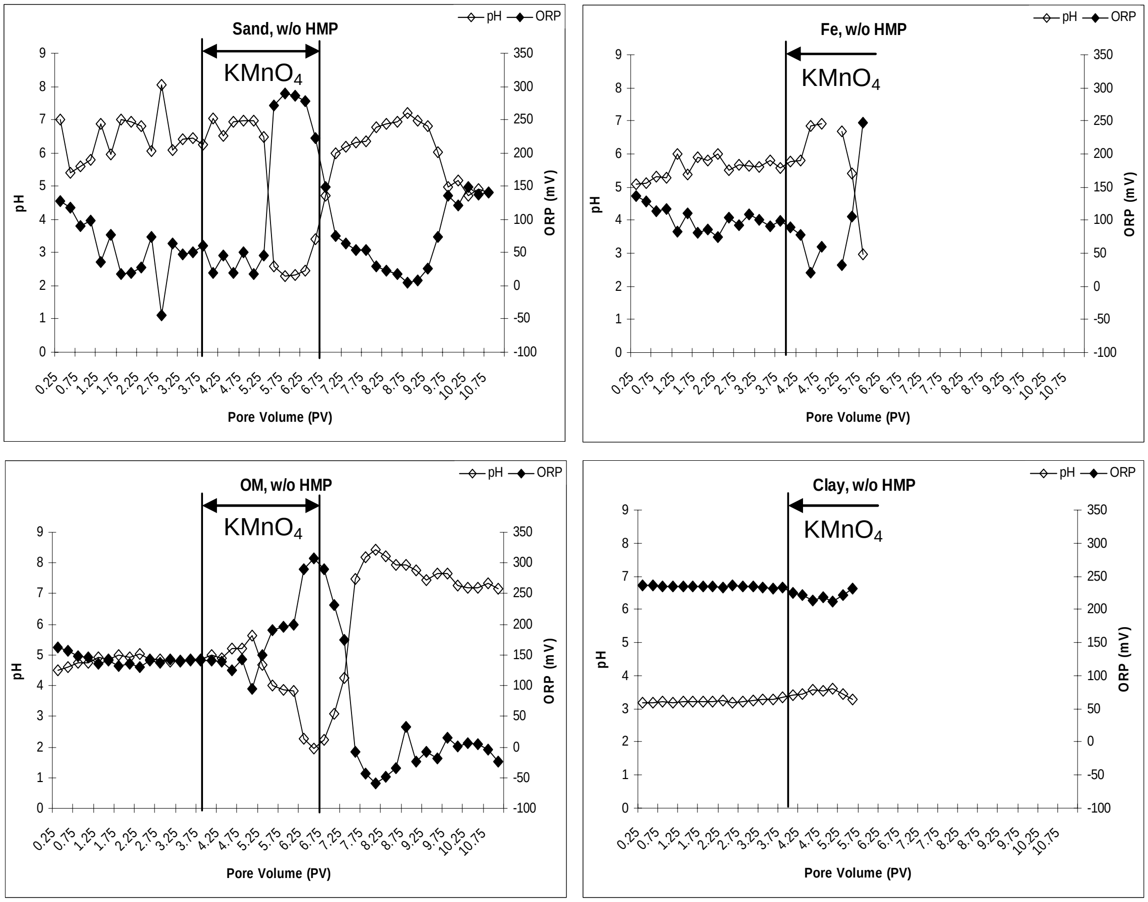


Figure 15. ORP and pH of Column Effluent For Each Pore Volume of Solution Delivered For Each Media Type.

Transport studies with the use of sodium hexametaphosphate. Table 10 presents the mass balance on Mn for the columns tests run with the stabilization aid HMP (1,000 mg/L). Compared to conditions without HMP (Table 9):

- There is a shift in the mass balance in iron- and clay-containing columns, attributable in large part to the increase in the mass of Mn introduced to the columns with HMP (i.e., columns did not plug with HMP therefore the full design 2.5 PVs of solution were passed through these columns).
- There is a significant increase in Mn-effluent as MnO_2 for the iron-containing column, which is evidence of improved particle stabilization when coupled with the fact that the column with HMP did not plug.
- There is little difference in the overall mass balance in sand-only and organic-carbon containing columns. It was expected for this mass balance to shift toward less Mn-retained and greater Mn-effluent due to particle stabilization with HMP.

Table 10. Percent of Mn Introduced to Columns Using Stabilization Aid HMP as Each Species.

	Species	Sand	Sand + 1% FeO(OH)*	Sand + 0.5% organic carbon	Sand + 20% Clay*
Mn-effluent	as MnO_4^-	34.0%	47.4%	0%	15.2%
	as MnO_2	1.4%	4.0%	0.9%	0.8%
Mn-retained	as DI-extractable Mn	0.7%	0.4%	0.8%	0.6%
	as BaCl-extractable Mn	1.6%	1.0%	1.5%	13.6%
	as MnO_2	62.3%	47.2%	96.8%	69.8%

Figure 16 shows the % decrease in MnO_2 deposition in the source zone (where the majority of deposition occurs as shown in Figure 13) for each media with the use of 1,000 mg/L HMP. Note that the calculated values for the iron-containing and clay-containing columns, which plugged and experienced restricted flow after 1 PV of oxidant delivery when HMP was not used, account for the difference in the total mass of oxidant delivered to the columns. The method for accounting for the oxidant mass difference is to apply a correction factor corresponding with the difference in the volume of oxidant delivered. This correction approach assumes that the deposition of manganese dioxides with oxidant delivery is a linear process (i.e., MnO_2 deposition increases linearly with the volume of oxidant introduced). There are limitations to this assumption, as follows:

- As permanganate passes through the column, less TCE is available over time for the permanganate to oxidize and generate particles, affecting the rate of particle generation and likely the rate of deposition. It is likely that particle accumulation decreases over time, which would translate to Figure 16 values being biased high.
- As particles deposit in the source area, it is likely that pore voids are being filled over time. This may translate to a straining effect, where smaller and smaller particles are able to pass through the media over time, resulting in increased particle deposition over time. This would translate to Figure 16 values being biased low.

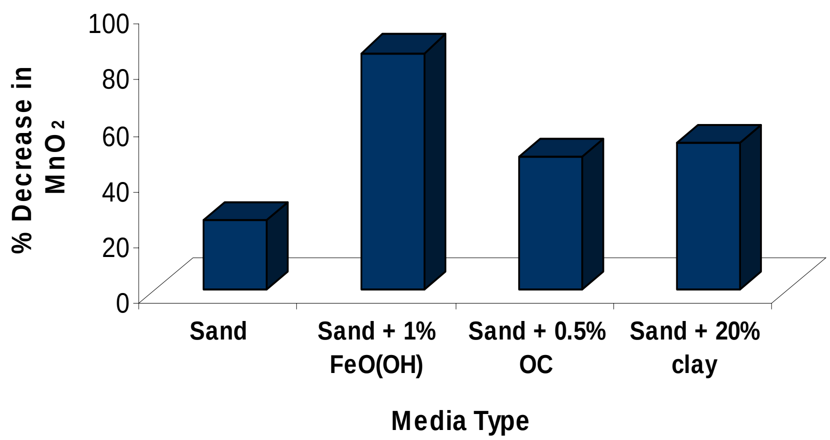


Figure 16. Percent Decrease in MnO_2 Deposition in Source Zone With 1000 mg/L HMP.

In presenting Figure 16, it is assumed that these biases cancel each other to an extent, but the specific error associated with each type of bias is unknown and cannot be experimentally resolved based on current limited understanding of MnO_2 particle behavior in porous media. It is not expected that results are drastically biased high because of three reasons:

- The iron-containing columns experienced greater MnO_2 deposition in the source zone overall without HMP present even though the total mass of Mn delivered was approximately 40% of the mass of Mn delivered with HMP present.
- The clay-containing columns experienced similar masses of MnO_2 deposition despite the fact that Mn delivered without HMP was approximately 40% of the mass of Mn delivered with HMP present.
- Significant reduction in MnO_2 deposition occurred in the sand-only and sand + organic carbon columns with HMP present in solution when equal volumes of oxidant were delivered with and without HMP.

While Table 10 indicates that the extent of Mn retained in the sand-only and organic carbon-containing columns changes little with the use of HMP, Figure 16 indicates that there is a shift in the location of the Mn deposition. With HMP, significantly less deposition occurs at the point of contact with the oxidant and contaminant (source zone), and that the MnO_2 migrates further downgradient, depositing in latter sections of the column.

Figure 17 shows total solids concentrations for the column tests conducted with HMP. The total solids concentrations with HMP are similar in the sand-only and organic carbon-containing columns without HMP (Figure 14). This is consistent with the Mn mass balance information presented in Tables 9 and 10 where Mn-effluent as MnO_2 percentages are similar for conditions with and without HMP. Because the columns containing iron and clay plugged without HMP, results aren't directly comparable to those with HMP, however the fact that the columns with HMP did not plug and the solids were transported through to the effluent is a key finding of these studies.

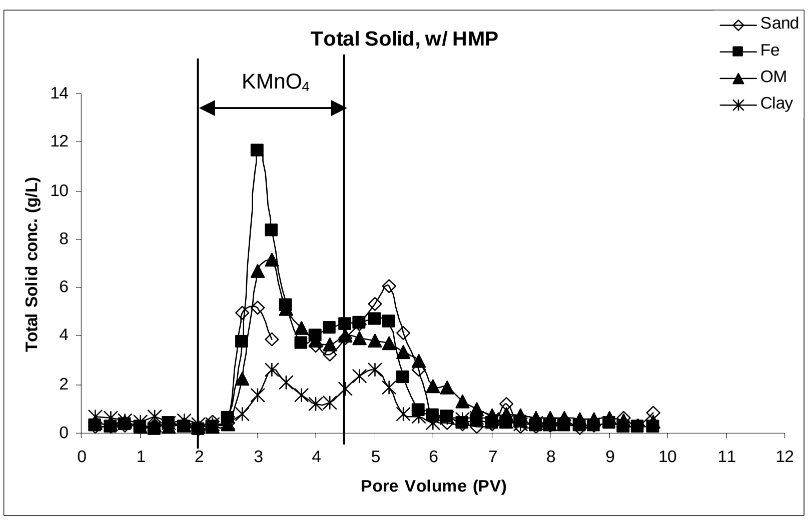


Figure 17. Total Solids Concentration in Column Effluent With Volume of Solution Delivered in Columns Conducted with HMP.

Figure 18 shows column effluent pH and ORP for each column conducted with HMP. Just like columns conducted without HMP, the expected trend of increased ORP and decreased pH during the oxidant delivery period are evident in the sand-only columns. Of note, however, is that with HMP present, the sand-only columns don't quite return to pre-oxidation pH and ORP conditions, but instead rebound to a level approximately between the pre-oxidation and during-oxidation conditions.

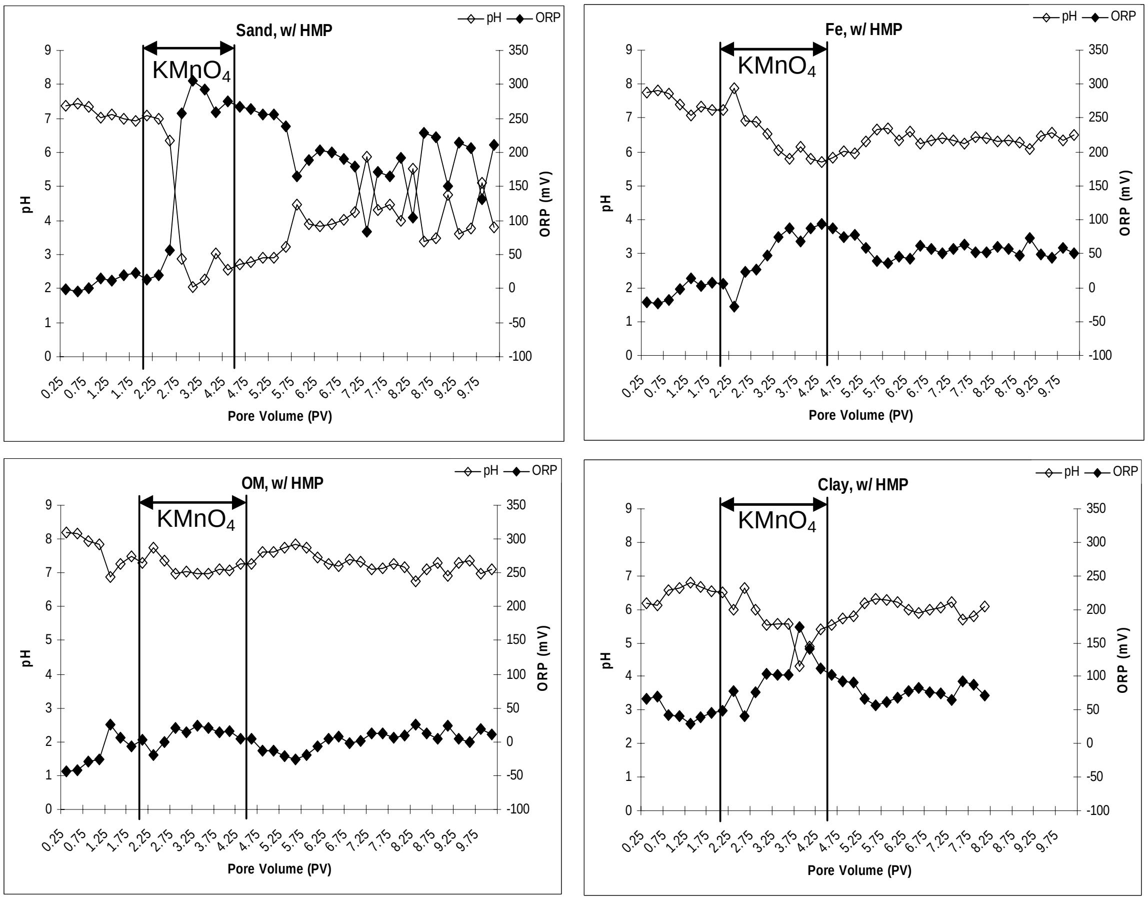


Figure 18. ORP and pH of Column Effluent For Each Pore Volume of Solution Delivered and Each Media Type For Columns Conducted With HMP.

The iron-containing and organic carbon-containing columns have similar profiles. It appears that pH is buffered by the presence of HMP. It is postulated that the less acidic (i.e., higher soil pH, Table 6) nature of these media compared to the other two results in less electrostatic association of the HMP with the media and greater amounts retained in the aqueous phase. This would translate to the greater pH buffering observed. Furthermore, spikes in ORP are curtailed in these columns even though permanganate was observed and measured throughout the column and in column effluent. It is postulated that the HMP interferes with the time to ORP measurement equilibration (i.e., requires a longer duration to equilibrate than allowed for measurement) and that the measurements are thus biased low. It is not believed that the actual system ORP is as low as the measurements indicate during the oxidation phase because (1) permanganate is

evident within the column and in column effluent during the delivery and initial portion of the post-delivery phase, and (2) the overall mass of MnO_2 generated in the organic carbon-containing columns with and without HMP agrees within 2%, indicating that reactant concentrations are uniform between the two columns and that flow conditions are similar (tracer test results concur).

In comparing the total solids profiles to the pH profiles of columns both with and without HMP, an interesting effect is noted. Total solids concentrations increase approximately 1 PV after permanganate delivery, as anticipated, due to the generation of MnO_2. There is a subsequent decrease in particle concentrations during the latter part of oxidant delivery, followed by a small but notable increase (for most columns) after oxidant delivery is ceased and conditions are reverted back to baseline groundwater flow-through. A specific correlation has not yet been made, however the total solids profile appears to follow pH profiles in the columns; where increased solids in the column effluent appear as pH drops significantly, and the small increase post-oxidation corresponds with an increase in pH toward baseline conditions. This effect is consistent with anticipated electrostatic effects. At lower pH, the mostly negatively-charged soil surfaces (due to low pH_{pzc} values, Table 6) become protonated toward neutrality and even to a positively charged condition when $pH < pH_{pzc}$. This translates to less electrostatic repulsion of the MnO_2 particles and greater sorption at the lower pH range. When pH increases, OH^- ion competes with MnO_2 for electrostatic association with the media surfaces, which can result in their desorption from the media and release from the column. With HMP present, there are several advantages with respect to avoiding electrostatic attraction between the particles and the media. First, the strongly negatively charged HMP can associate with soil surfaces and inhibit attraction for the more weakly-charged MnO_2 particles. Also, with its pH buffering effects, lower pH conditions that result in greater association of particles with the media can be avoided.

Discussion

Results of batch-scale experimentation to compare the ability of four different particle stabilization aids to inhibit MnO_2 deposition indicate the favorability of sodium hexametaphosphate (HMP) over other stabilization aids. Table 11 presents the primary and secondary evidence of HMP's preferred ranking. Primary evidence is specific to HMP, while secondary evidence is also characteristic of Gum Arabic and Xanthan Gum. Dowfax presented conditions that were even less favorable than the use of no stabilization aid, likely due to its significant reaction with permanganate (Figure 8).

Based on the results described in Table 11, HMP (1,000 mg/L included in permanganate solution delivered) was employed as a particle stabilization aid in transport studies. Prior to applying the stabilization aid, columns were conducted without HMP to (1) provide a baseline response, and (2) compare the effects of media type on particle retention.

Table 11. Measurements Demonstrating Viability of HMP for MnO_2 Particle Stabilization.

Evidence	Measurement	Basis
Primary	Permanganate concentration vs. time	HMP does not react nonproductively with permanganate resulting in the generation of additional MnO_2
	Particle mass as a function of filter size	Majority of particles under varied conditions are < 0.10 μm
	Spec. measurements at 418 nm coupled with filtration (to calibrate for [MnO_2] vs. time	A large percentage of particles are below the ~0.10 mm detection limit of the spectrophotometric method under a range of experimental conditions
	Optical measurements of particle size (laser)	Results in the smallest-sized particles over the widest range of reaction conditions.
Secondary	Spec. measurements at 418 nm and 525 nm	Correction factors to account for particle light scattering at 525 nm permanganate measurement wavelength deviate significantly from the no stabilization aid conditions, indicating a significant difference in particle structure and/or size
	Spec measurements and analyses at 418 nm	Increased T_{max}, decreased $k_{s\text{-}obs}$, increased T_{max}-T_{min}
	Spec. measurements at 418 nm coupled with filtration (to calibrate for [MnO_2] vs. time	Particles are stable in solution (i.e., do not coagulate) over extensive reaction time periods
	Optical measurements of zeta potential	Zeta potential is more negative than the no stabilization aid conditions

Regarding the latter objective, important differences in MnO_2 retention in the columns were observed. These differences can be attributed to differences in both physical and chemical characteristics of the porous media. Clay-containing media's significantly smaller average particle size and larger uniformity coefficient results in greater particle retention. The column ultimately clogged and completely restricted flow within 1 PV of oxidant delivery. Also, the near neutral zeta potential of the clay-containing media indicates that potential repulsive forces between the media and the particles are less than in the other three media with highly negative zeta potential values. MnO_2 particles carry a slightly negative charge under moderate pH conditions.

While the iron-containing columns have apparently very similar physical and chemical properties to the sand-only column, as anticipated based on only 1% addition of FeO(OH), MnO_2 retention in this column was very different than the sand-only column. Like the sand + clay column, this one also experienced completely restricted flow within 1 PV of oxidant delivery. It is speculated that this primary difference relates to changes in speciation of the iron due to changes in pH and ORP of the system during oxidation. When oxidant is introduced to the columns, a notable brownish-orange color is observed in the column effluent, indicative of the mobilization of Fe^{3+}. Fe^{3+} can introduce important differences to the system that affect particle interactions. It may (1) act as a coagulant, facilitating MnO_2 aggregation and deposition, (2) convert to other iron hydroxide species that may precipitate, introducing additional particles to the system, and (3) substitute for Mn in the MnO_2 aggregate structure (isomorphic substitution), if it co-precipitates with MnO_2, resulting in an overall positive charge on the surface, which would then be attracted to the negative surfaces of the porous media (Figure 19).

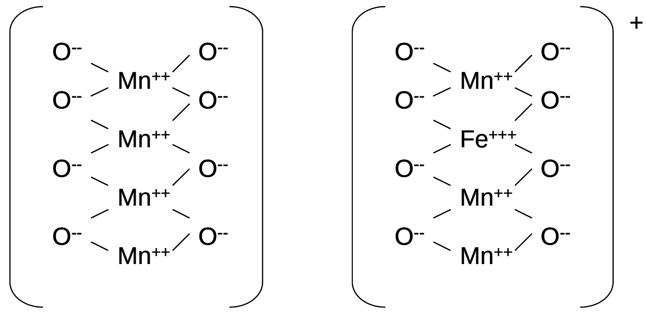


Figure 19. Left-hand Side Shows un-substituted MnO_2 With no Net Charge. Surface Charge is Slightly Negative in Solution Due to O^- on Surface Edge. Right-hand Side Shows Fe^{3+}-substituted MnO_2 Aggregate With a Net Positive Charge.

The most surprising results were offered by the organic-carbon containing column. Permanganate reacts readily with organic carbon in soil, creating excess MnO_2 beyond those particles created by contaminant reaction. The organic carbon column did have more extensive MnO_2 deposition than the sand-only column, and permanganate was never detected beyond approximately half-way through the column with 2.5 PVs of oxidant delivery. However, the column experienced no restricted flow. It is postulated that when organic carbon in the media is oxidized, void space in the media is increased. Deposition of MnO_2 may be off-set by the increased void space. There was no measurable difference in flow rate through during oxidant delivery or post-oxidation indicative of either increased or decreased porosity, however differences may be undetectable through the crude measurement of volume over time. Future evaluations will include a post-oxidation tracer test to more thoroughly evaluate potential differences in overall porosity.

Clearly the chemical and physical characteristics of both the media and the MnO_2 particles dictate particle deposition during ISCO. Media characteristics that are the best predictors of challenged flow due to deposition include: (1) particle size, (2) particle size distribution, (3) potential for mineral dissolution (resulting in co-precipitation or other aforementioned chemical effects), (4) zeta potential coupled with pH_{pzc} measurements. Predictors 1 and 2 are commonly measured characteristics, while predictor 3 can be indicated by a high cation content in groundwater (e.g., Fe^{3+} in an iron-enriched media). Predictor 4 involves more complex laboratory measurements that are not frequently conducted, therefore practicality dictates focus on predictors 1-3 at the field scale.

The use of HMP with permanganate is intended to alter the physical and chemical characteristics of MnO_2 particles to improve particle mobility and inhibit deposition, particularly at the point of contact of the oxidant and contaminant. HMP alters system chemistry, which translates to decreased particle retention by the following possible mechanisms: (1) increased net negative charge promoting particle stabilization in solution and inhibiting coagulation, precipitation, and co-precipitation; (2) smaller particle size resulting from mechanism 1; (3) association of HMP with soil surfaces, decreasing the association of MnO_2 with soil surfaces; and (4) buffered pH, resulting in less electrostatic attraction between soil surfaces and particles that can occur at the lower pH that results from contaminant oxidation. The positive effects of HMP addition were

observed primarily as percent reductions of MnO_2 deposition at the contaminant source zone in all columns, ranging from 25-85%, depending on media type.

Aside from identifying and evaluating HMP as a viable particle stabilization aid to employ with ISCO, particularly for NAPL sites, this project resulted in several additional significant findings:

- Even with the use of HMP, very little MnO_2 generated during permanganate ISCO (< 2%) remained in a mobile phase for the length of a 60-cm column. HMP's positive effects were observed primarily at the point of contact of the oxidant and contaminant. While evaluations of Mn speciation rarely occur during field application, the perception is often that MnO_2 does not create issues such as restricted flow. The fact is that without doing specific analyses of the co-location of contaminant residual and deposited MnO_2, this effect would be challenging to observe at the field scale. Measurements of back-pressure with oxidant delivery may prove to be a valuable indicator of challenges to flow created by MnO_2, however localized deposition at the point of contact with the contaminant would not be detected with this approach where the flowing oxidant can readily bypass the flow-restricted area.
- Permanganate can readily bypass NAPL contaminant. This is apparent in the sand-only column without HMP and with all but the organic-carbon containing column with HMP. Permanganate was not provided in excess of the stoichiometric TCE requirement, however permanganate was observed in the column effluent 60 cm from the contaminated source zone through which the oxidant directly passes. The bypass is likely due to NAPL dissolution limitations.
- Oxidation of organic-carbon containing media resulted in a short-term post-ISCO decrease in ORP not typically associated with oxidizing conditions. This is likely a result of the generation of low-molecular weight organic acids that result in overall reducing conditions. This indicates that permanganate ISCO in carbon-rich media can result in a down-gradient plume of reducing conditions that may be a beneficial carbon source to anaerobic microorganisms that can readily degrade dilute contaminant plume concentrations. ISCO is often deemed not fit for high organic carbon sites, however it may hold two-fold benefits for hot spot treatment of source zones at such sites; oxidation of high mass density contaminant and enhanced biodegradation of lower concentrations down-gradient from the treated hot spot.
- Post-ISCO, very little Mn was present in the columns both with and without HMP in a readily extractable form, indicating that it is unlikely that permanganate ISCO will result in a long-term source of dissolved Mn at a site except under highly reducing conditions where MnO_2 may be reduced to Mn^{2+}.

Concluding Summary

The objectives of SERDP Project ER-1484 were to (1) determine if manganese dioxide particles can be stabilized/controlled in an aqueous phase to allow for transport through a solids pahse, thereby inhibiting subsurface deposition, and (2) determine the dependence of stabilization and control of MnO_2 particles on porous media and groundwater characteristics. Bench-scale batch experiments were conducted initially to study chemical interactions, focusing on the identification of a viable particle stabilization aid. Results of the bench-scale studies indicate that sodium hexametaphosphate (HMP) is a promising stabilization aid due to its ability to maintain a smaller average particle size and particles stabilized over long reaction periods and a wide range of groundwater conditions. Groundwater conditions that affect particle size and behavior both with and without HMP include particle concentration, pH, and ionic content; however favorable conditions are maintained with HMP despite these influences. In other words, although particle size is affected by pH, etc., the particles remain small, mobile, and suspended under different pH, etc., conditions.

Transport studies were conducted to evaluate particle deposition in various porous media types with and without HMP. Physical and chemical characteristics of the porous media, including pH_{pzc}, zeta potential, particle size (average and distribution), and mineralogy, dictate the extent of MnO_2 deposition without the presence of HMP. This is evidenced most strongly by the completely restricted flow that resulted in columns containing modest additions of 20% clay and 1% FeO(OH) to a base sand in which flow was not restricted by MnO_2 deposition. An important condition that influences particle deposition is the presence of, or generation of, cationic species (e.g., Fe^{3+}) that enhance particle coagulation and electrostatic attraction to the porous media. Including 1,000 mg/L of HMP with the permanganate solution, which do not react with each other, decreased MnO_2 deposition in the contaminant source zone by 25-85% depending on media type. A decrease of 85% deposition occurred in the iron-containing column and a decrease of 53% occurred in the clay-containing column, which were the two columns that experienced completely restricted flow within delivery of 1 PV of permanganate solution without HMP. Flow was not restricted in columns containing HMP. The ultimate implication of these is that the use of an MnO_2 stabilization aid during permanganate delivery can result in (1) improved contact of the oxidant and contaminant over the longer term, (2) decreased potential for restricted flow (or flow bypass around contaminants), and (3) greater potential for limiting or eliminating contaminant rebound that may occur as a result of flow bypass.

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Appendix I. Key of Sample Constituents for Spectrophotometric Studies (full factorial design)

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
9	10	3	Base	none	equimolar	none
10	100	3	Base	none	equimolar	none
11	10	7	Base	none	equimolar	none
12	100	7	Base	none	equimolar	none
13	10	3	Ca	none	equimolar	none
14	100	3	Ca	none	equimolar	none
15	10	7	Ca	none	equimolar	none
16	100	7	Ca	none	equimolar	none
17	10	3	Base	sand	equimolar	none
18	100	3	Base	sand	equimolar	none
19	10	7	Base	sand	equimolar	none
20	100	7	Base	sand	equimolar	none
21	10	3	Ca	sand	equimolar	none
22	100	3	Ca	sand	equimolar	none
23	10	7	Ca	sand	equimolar	none
24	100	7	Ca	sand	equimolar	none
25	10	3	Base	none	ox	none
26	100	3	Base	none	ox	none
27	10	7	Base	none	ox	none
28	100	7	Base	none	ox	none
29	10	3	Ca	none	ox	none
30	100	3	Ca	none	ox	none
31	10	7	Ca	none	ox	none
32	100	7	Ca	none	ox	none
33	10	3	Base	none	ox	none
34	100	3	Base	none	ox	none
35	10	7	Base	none	ox	none
36	100	7	Base	none	ox	none
37	10	3	Ca	none	ox	none
38	100	3	Ca	none	ox	none
39	10	7	Ca	none	ox	none
40	100	7	Ca	none	ox	none
41	10	3	Base	none	equimolar	1a
42	100	3	Base	none	equimolar	1a
43	10	7	Base	none	equimolar	1a
44	100	7	Base	none	equimolar	1a
45	10	3	Ca	none	equimolar	1a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
46	100	3	Ca	none	equimolar	1a
47	10	7	Ca	none	equimolar	1a
48	100	7	Ca	none	equimolar	1a
49	10	3	Base	sand	equimolar	1a
50	100	3	Base	sand	equimolar	1a
51	10	7	Base	sand	equimolar	1a
52	100	7	Base	sand	equimolar	1a
53	10	3	Ca	sand	equimolar	1a
54	100	3	Ca	sand	equimolar	1a
55	10	7	Ca	sand	equimolar	1a
56	100	7	Ca	sand	equimolar	1a
57	10	3	Base	none	ox	1a
58	100	3	Base	none	ox	1a
59	10	7	Base	none	ox	1a
60	100	7	Base	none	ox	1a
61	10	3	Ca	none	ox	1a
62	100	3	Ca	none	ox	1a
63	10	7	Ca	none	ox	1a
64	100	7	Ca	none	ox	1a
65	10	3	Base	sand	ox	1a
66	100	3	Base	sand	ox	1a
67	10	7	Base	sand	ox	1a
68	100	7	Base	sand	ox	1a
69	10	3	Ca	sand	ox	1a
70	100	3	Ca	sand	ox	1a
71	10	7	Ca	sand	ox	1a
72	100	7	Ca	sand	ox	1a
73	10	3	Base	none	red	none
74	100	3	Base	none	red	none
75	10	3	Base	sand	red	none
76	100	3	Base	sand	red	none
77	10	3	Base	none	red	1a
78	100	3	Base	none	red	1a
79	10	3	Base	sand	red	1a
80	100	3	Base	sand	red	1a
81	10	3	Base	none	equimolar	1b
82	100	3	Base	none	equimolar	1b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
83	10	3	Base	sand	equimolar	1b
84	100	3	Base	sand	equimolar	1b
85	10	3	Base	none	ox	1b
86	100	3	Base	none	ox	1b
87	10	3	Base	sand	ox	1b
88	100	3	Base	sand	ox	1b
89	10	3	Base	none	red	1b
90	100	3	Base	none	red	1b
91	10	3	Base	sand	red	1b
92	100	3	Base	sand	red	1b
93	10	3	Base	none	equimolar	2a
94	100	3	Base	none	equimolar	2a
95	10	3	Base	sand	equimolar	2a
96	100	3	Base	sand	equimolar	2a
97	10	3	Base	none	ox	2a
98	100	3	Base	none	ox	2a
99	10	3	Base	sand	ox	2a
100	100	3	Base	sand	ox	2a
101	10	3	Base	none	equimolar	2b
102	100	3	Base	none	equimolar	2b
103	10	3	Base	sand	equimolar	2b
104	100	3	Base	sand	equimolar	2b
105	10	3	Base	none	ox	2b
106	100	3	Base	none	ox	2b
107	10	3	Base	sand	ox	2b
108	100	3	Base	sand	ox	2b
109	10	3	Base	none	red	2a
110	100	3	Base	none	red	2a
111	10	3	Base	sand	red	2a
112	100	3	Base	sand	red	2a
113	10	3	Base	none	red	2b
114	100	3	Base	none	red	2b
115	10	3	Base	sand	red	2b
116	100	3	Base	sand	red	2b
117	10	3	Base	none	equimolar	3a
118	100	3	Base	none	equimolar	3a
119	10	3	Base	sand	equimolar	3a
120	100	3	Base	sand	equimolar	3a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
121	10	3	Base	none	ox	3a
122	100	3	Base	none	ox	3a
123	10	3	Base	sand	ox	3a
124	100	3	Base	sand	ox	3a
125	10	3	Base	none	equimolar	3b
126	100	3	Base	none	equimolar	3b
127	10	3	Base	sand	equimolar	3b
128	100	3	Base	sand	equimolar	3b
129	10	3	Base	none	ox	3b
130	100	3	Base	none	ox	3b
131	10	3	Base	sand	ox	3b
132	100	3	Base	sand	ox	3b
133	10	3	Base	none	red	3a
134	100	3	Base	none	red	3a
135	10	3	Base	sand	red	3a
136	100	3	Base	sand	red	3a
137	10	3	Base	none	red	3b
138	100	3	Base	none	red	3b
139	10	3	Base	sand	red	3b
140	100	3	Base	sand	red	3b
141	10	3	Base	none	equimolar	4a
142	100	3	Base	none	equimolar	4a
143	10	3	Base	sand	equimolar	4a
144	100	3	Base	sand	equimolar	4a
145	10	3	Base	none	ox	4a
146	100	3	Base	none	ox	4a
147	10	3	Base	sand	ox	4a
148	100	3	Base	sand	ox	4a
149	10	3	Base	none	equimolar	4b
150	100	3	Base	none	equimolar	4b
151	10	3	Base	sand	equimolar	4b
152	100	3	Base	sand	equimolar	4b
153	10	3	Base	none	ox	4b
154	100	3	Base	none	ox	4b
155	10	3	Base	sand	ox	4b
156	100	3	Base	sand	ox	4b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
157	10	3	Base	none	red	4a
158	100	3	Base	none	red	4a
159	10	3	Base	sand	red	4a
160	100	3	Base	sand	red	4a
161	10	3	Base	none	red	4b
162	100	3	Base	none	red	4b
163	10	3	Base	sand	red	4b
164	100	3	Base	sand	red	4b
165	10	7	Base	none	red	none
166	100	7	Base	none	red	none
167	10	7	Base	sand	red	none
168	100	7	Base	sand	red	none
169	10	7	Base	none	red	1a
170	100	7	Base	none	red	1a
171	10	7	Base	sand	red	1a
172	100	7	Base	sand	red	1a
173	10	7	Base	none	equimolar	1b
174	100	7	Base	none	equimolar	1b
175	10	7	Base	sand	equimolar	1b
176	100	7	Base	sand	equimolar	1b
177	10	7	Base	none	ox	1b
178	100	7	Base	none	ox	1b
179	10	7	Base	sand	ox	1b
180	100	7	Base	sand	ox	1b
181	10	7	Base	none	red	1b
182	100	7	Base	none	red	1b
183	10	7	Base	sand	red	1b
184	100	7	Base	sand	red	1b
185	10	7	Base	none	equimolar	2a
186	100	7	Base	none	equimolar	2a
187	10	7	Base	sand	equimolar	2a
188	100	7	Base	sand	equimolar	2a
189	10	7	Base	none	ox	2a
190	100	7	Base	none	ox	2a
191	10	7	Base	sand	ox	2a
192	100	7	Base	sand	ox	2a
193	10	7	Base	none	equimolar	2b
194	100	7	Base	none	equimolar	2b
195	10	7	Base	sand	equimolar	2b
196	100	7	Base	sand	equimolar	2b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
197	10	7	Base	none	ox	2b
198	100	7	Base	none	ox	2b
199	10	7	Base	sand	ox	2b
200	100	7	Base	sand	ox	2b
201	10	7	Base	none	red	2a
202	100	7	Base	none	red	2a
203	10	7	Base	sand	red	2a
204	100	7	Base	sand	red	2a
205	10	7	Base	none	red	2b
206	100	7	Base	none	red	2b
207	10	7	Base	sand	red	2b
208	100	7	Base	sand	red	2b
209	10	7	Base	none	equimolar	3a
210	100	7	Base	none	equimolar	3a
211	10	7	Base	sand	equimolar	3a
212	100	7	Base	sand	equimolar	3a
213	10	7	Base	none	ox	3a
214	100	7	Base	none	ox	3a
215	10	7	Base	sand	ox	3a
216	100	7	Base	sand	ox	3a
217	10	7	Base	none	equimolar	3b
218	100	7	Base	none	equimolar	3b
219	10	7	Base	sand	equimolar	3b
220	100	7	Base	sand	equimolar	3b
221	10	7	Base	none	ox	3b
222	100	7	Base	none	ox	3b
223	10	7	Base	sand	ox	3b
224	100	7	Base	sand	ox	3b
225	10	7	Base	none	red	3a
226	100	7	Base	none	red	3a
227	10	7	Base	sand	red	3a
228	100	7	Base	sand	red	3a
229	10	7	Base	none	red	3b
230	100	7	Base	none	red	3b
231	10	7	Base	sand	red	3b
232	100	7	Base	sand	red	3b
233	10	7	Base	none	equimolar	4a
234	100	7	Base	none	equimolar	4a
235	10	7	Base	sand	equimolar	4a
236	100	7	Base	sand	equimolar	4a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
237	10	7	Base	none	ox	4a
238	100	7	Base	none	ox	4a
239	10	7	Base	sand	ox	4a
240	100	7	Base	sand	ox	4a
241	10	7	Base	none	equimolar	4b
242	100	7	Base	none	equimolar	4b
243	10	7	Base	sand	equimolar	4b
244	100	7	Base	sand	equimolar	4b
245	10	7	Base	none	ox	4b
246	100	7	Base	none	ox	4b
247	10	7	Base	sand	ox	4b
248	100	7	Base	sand	ox	4b
249	10	7	Base	none	red	4a
250	100	7	Base	none	red	4a
251	10	7	Base	sand	red	4a
252	100	7	Base	sand	red	4a
253	10	7	Base	none	red	4b
254	100	7	Base	none	red	4b
255	10	7	Base	sand	red	4b
256	100	7	Base	sand	red	4b
257	10	3	Ca	none	red	none
258	100	3	Ca	none	red	none
259	10	3	Ca	sand	red	none
260	100	3	Ca	sand	red	none
261	10	3	Ca	none	red	1a
262	100	3	Ca	none	red	1a
263	10	3	Ca	sand	red	1a
264	100	3	Ca	sand	red	1a
265	10	3	Ca	none	equimolar	1b
266	100	3	Ca	none	equimolar	1b
267	10	3	Ca	sand	equimolar	1b
268	100	3	Ca	sand	equimolar	1b
269	10	3	Ca	none	ox	1b
270	100	3	Ca	none	ox	1b
271	10	3	Ca	sand	ox	1b
272	100	3	Ca	sand	ox	1b
273	10	3	Ca	none	red	1b
274	100	3	Ca	none	red	1b
275	10	3	Ca	sand	red	1b
276	100	3	Ca	sand	red	1b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
277	10	3	Ca	none	equimolar	2a
278	100	3	Ca	none	equimolar	2a
279	10	3	Ca	sand	equimolar	2a
280	100	3	Ca	sand	equimolar	2a
281	10	3	Ca	none	ox	2a
282	100	3	Ca	none	ox	2a
283	10	3	Ca	sand	ox	2a
284	100	3	Ca	sand	ox	2a
285	10	3	Ca	none	equimolar	2b
286	100	3	Ca	none	equimolar	2b
287	10	3	Ca	sand	equimolar	2b
288	100	3	Ca	sand	equimolar	2b
289	10	3	Ca	none	ox	2b
290	100	3	Ca	none	ox	2b
291	10	3	Ca	sand	ox	2b
292	100	3	Ca	sand	ox	2b
293	10	3	Ca	none	red	2a
294	100	3	Ca	none	red	2a
295	10	3	Ca	sand	red	2a
296	100	3	Ca	sand	red	2a
297	10	3	Ca	none	red	2b
298	100	3	Ca	none	red	2b
299	10	3	Ca	sand	red	2b
300	100	3	Ca	sand	red	2b
301	10	3	Ca	none	equimolar	3a
302	100	3	Ca	none	equimolar	3a
303	10	3	Ca	sand	equimolar	3a
304	100	3	Ca	sand	equimolar	3a
305	10	3	Ca	none	ox	3a
306	100	3	Ca	none	ox	3a
307	10	3	Ca	sand	ox	3a
308	100	3	Ca	sand	ox	3a
309	10	3	Ca	none	equimolar	3b
310	100	3	Ca	none	equimolar	3b
311	10	3	Ca	sand	equimolar	3b
312	100	3	Ca	sand	equimolar	3b
313	10	3	Ca	none	ox	3b
314	100	3	Ca	none	ox	3b
315	10	3	Ca	sand	ox	3b
316	100	3	Ca	sand	ox	3b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
317	10	3	Ca	none	red	3a
318	100	3	Ca	none	red	3a
319	10	3	Ca	sand	red	3a
320	100	3	Ca	sand	red	3a
321	10	3	Ca	none	red	3b
322	100	3	Ca	none	red	3b
323	10	3	Ca	sand	red	3b
324	100	3	Ca	sand	red	3b
325	10	3	Ca	none	equimolar	4a
326	100	3	Ca	none	equimolar	4a
327	10	3	Ca	sand	equimolar	4a
328	100	3	Ca	sand	equimolar	4a
329	10	3	Ca	none	ox	4a
330	100	3	Ca	none	ox	4a
331	10	3	Ca	sand	ox	4a
332	100	3	Ca	sand	ox	4a
333	10	3	Ca	none	equimolar	4b
334	100	3	Ca	none	equimolar	4b
335	10	3	Ca	sand	equimolar	4b
336	100	3	Ca	sand	equimolar	4b
337	10	3	Ca	none	ox	4b
338	100	3	Ca	none	ox	4b
339	10	3	Ca	sand	ox	4b
340	100	3	Ca	sand	ox	4b
341	10	3	Ca	none	red	4a
342	100	3	Ca	none	red	4a
343	10	3	Ca	sand	red	4a
344	100	3	Ca	sand	red	4a
345	10	3	Ca	none	red	4b
346	100	3	Ca	none	red	4b
347	10	3	Ca	sand	red	4b
348	100	3	Ca	sand	red	4b
349	10	7	Ca	none	red	none
350	100	7	Ca	none	red	none
351	10	7	Ca	sand	red	none
352	100	7	Ca	sand	red	none
353	10	7	Ca	none	red	1a
354	100	7	Ca	none	red	1a
355	10	7	Ca	sand	red	1a
356	100	7	Ca	sand	red	1a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
357	10	7	Ca	none	equimolar	1b
358	100	7	Ca	none	equimolar	1b
359	10	7	Ca	sand	equimolar	1b
360	100	7	Ca	sand	equimolar	1b
361	10	7	Ca	none	ox	1b
362	100	7	Ca	none	ox	1b
363	10	7	Ca	sand	ox	1b
364	100	7	Ca	sand	ox	1b
365	10	7	Ca	none	red	1b
366	100	7	Ca	none	red	1b
367	10	7	Ca	sand	red	1b
368	100	7	Ca	sand	red	1b
369	10	7	Ca	none	equimolar	2a
370	100	7	Ca	none	equimolar	2a
371	10	7	Ca	sand	equimolar	2a
372	100	7	Ca	sand	equimolar	2a
373	10	7	Ca	none	ox	2a
374	100	7	Ca	none	ox	2a
375	10	7	Ca	sand	ox	2a
376	100	7	Ca	sand	ox	2a
377	10	7	Ca	none	equimolar	2b
378	100	7	Ca	none	equimolar	2b
379	10	7	Ca	sand	equimolar	2b
380	100	7	Ca	sand	equimolar	2b
381	10	7	Ca	none	ox	2b
382	100	7	Ca	none	ox	2b
383	10	7	Ca	sand	ox	2b
384	100	7	Ca	sand	ox	2b
385	10	7	Ca	none	red	2a
386	100	7	Ca	none	red	2a
387	10	7	Ca	sand	red	2a
388	100	7	Ca	sand	red	2a
389	10	7	Ca	none	red	2b
390	100	7	Ca	none	red	2b
391	10	7	Ca	sand	red	2b
392	100	7	Ca	sand	red	2b
393	10	7	Ca	none	equimolar	3a
394	100	7	Ca	none	equimolar	3a
395	10	7	Ca	sand	equimolar	3a
396	100	7	Ca	sand	equimolar	3a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
397	10	7	Ca	none	ox	3a
398	100	7	Ca	none	ox	3a
399	10	7	Ca	sand	ox	3a
400	100	7	Ca	sand	ox	3a
401	10	7	Ca	none	equimolar	3b
402	100	7	Ca	none	equimolar	3b
403	10	7	Ca	sand	equimolar	3b
404	100	7	Ca	sand	equimolar	3b
405	10	7	Ca	none	ox	3b
406	100	7	Ca	none	ox	3b
407	10	7	Ca	sand	ox	3b
408	100	7	Ca	sand	ox	3b
409	10	7	Ca	none	red	3a
410	100	7	Ca	none	red	3a
411	10	7	Ca	sand	red	3a
412	100	7	Ca	sand	red	3a
413	10	7	Ca	none	red	3b
414	100	7	Ca	none	red	3b
415	10	7	Ca	sand	red	3b
416	100	7	Ca	sand	red	3b
417	10	7	Ca	none	equimolar	4a
418	100	7	Ca	none	equimolar	4a
419	10	7	Ca	sand	equimolar	4a
420	100	7	Ca	sand	equimolar	4a
421	10	7	Ca	none	ox	4a
422	100	7	Ca	none	ox	4a
423	10	7	Ca	sand	ox	4a
424	100	7	Ca	sand	ox	4a
425	10	7	Ca	none	equimolar	4b
426	100	7	Ca	none	equimolar	4b
427	10	7	Ca	sand	equimolar	4b
428	100	7	Ca	sand	equimolar	4b
429	10	7	Ca	none	ox	4b
430	100	7	Ca	none	ox	4b
431	10	7	Ca	sand	ox	4b
432	100	7	Ca	sand	ox	4b
433	10	7	Ca	none	red	4a
434	100	7	Ca	none	red	4a
435	10	7	Ca	sand	red	4a
436	100	7	Ca	sand	red	4a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
437	10	7	Ca	none	red	4b
438	100	7	Ca	none	red	4b
439	10	7	Ca	sand	red	4b
440	100	7	Ca	sand	red	4b
441	10	3	PO4	none	equimolar	none
442	100	3	PO4	none	equimolar	none
443	10	3	PO4	sand	equimolar	none
444	100	3	PO4	sand	equimolar	none
445	10	3	PO4	none	ox	none
446	100	3	PO4	none	ox	none
447	10	3	PO4	sand	ox	none
448	100	3	PO4	sand	ox	none
449	10	3	PO4	none	equimolar	1a
450	100	3	PO4	none	equimolar	1a
451	10	3	PO4	sand	equimolar	1a
452	100	3	PO4	sand	equimolar	1a
453	10	3	PO4	none	ox	1a
454	100	3	PO4	none	ox	1a
455	10	3	PO4	sand	ox	1a
456	100	3	PO4	sand	ox	1a
457	10	3	PO4	none	equimolar	1b
458	100	3	PO4	none	equimolar	1b
459	10	3	PO4	sand	equimolar	1b
460	100	3	PO4	sand	equimolar	1b
461	10	3	PO4	none	ox	1b
462	100	3	PO4	none	ox	1b
463	10	3	PO4	sand	ox	1b
464	100	3	PO4	sand	ox	1b
465	10	3	PO4	none	equimolar	2a
466	100	3	PO4	none	equimolar	2a
467	10	3	PO4	sand	equimolar	2a
468	100	3	PO4	sand	equimolar	2a
469	10	3	PO4	none	ox	2a
470	100	3	PO4	none	ox	2a
471	10	3	PO4	sand	ox	2a
472	100	3	PO4	sand	ox	2a
473	10	3	PO4	none	equimolar	2b
474	100	3	PO4	none	equimolar	2b
475	10	3	PO4	sand	equimolar	2b
476	100	3	PO4	sand	equimolar	2b

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
477	10	3	PO4	none	ox	2b
478	100	3	PO4	none	ox	2b
479	10	3	PO4	sand	ox	2b
480	100	3	PO4	sand	ox	2b
481	10	3	PO4	none	equimolar	3a
482	100	3	PO4	none	equimolar	3a
483	10	3	PO4	sand	equimolar	3a
484	100	3	PO4	sand	equimolar	3a
485	10	3	PO4	none	ox	3a
486	100	3	PO4	none	ox	3a
487	10	3	PO4	sand	ox	3a
488	100	3	PO4	sand	ox	3a
489	10	3	PO4	none	equimolar	3b
490	100	3	PO4	none	equimolar	3b
491	10	3	PO4	sand	equimolar	3b
492	100	3	PO4	sand	equimolar	3b
493	10	3	PO4	none	ox	3b
494	100	3	PO4	none	ox	3b
495	10	3	PO4	sand	ox	3b
496	100	3	PO4	sand	ox	3b
497	10	3	PO4	none	equimolar	4a
498	100	3	PO4	none	equimolar	4a
499	10	3	PO4	sand	equimolar	4a
500	100	3	PO4	sand	equimolar	4a
501	10	3	PO4	none	ox	4a
502	100	3	PO4	none	ox	4a
503	10	3	PO4	sand	ox	4a
504	100	3	PO4	sand	ox	4a
505	10	3	PO4	none	equimolar	4b
506	100	3	PO4	none	equimolar	4b
507	10	3	PO4	sand	equimolar	4b
508	100	3	PO4	sand	equimolar	4b
509	10	3	PO4	none	ox	4b
510	100	3	PO4	none	ox	4b
511	10	3	PO4	sand	ox	4b
512	100	3	PO4	sand	ox	4b
513	10	7	PO4	none	equimolar	none
514	100	7	PO4	none	equimolar	none
515	10	7	PO4	sand	equimolar	none
516	100	7	PO4	sand	equimolar	none

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
517	10	7	PO4	none	ox	none
518	100	7	PO4	none	ox	none
519	10	7	PO4	sand	ox	none
520	100	7	PO4	sand	ox	none
521	10	7	PO4	none	equimolar	1a
522	100	7	PO4	none	equimolar	1a
523	10	7	PO4	sand	equimolar	1a
524	100	7	PO4	sand	equimolar	1a
525	10	7	PO4	none	ox	1a
526	100	7	PO4	none	ox	1a
527	10	7	PO4	sand	ox	1a
528	100	7	PO4	sand	ox	1a
529	10	7	PO4	none	equimolar	1b
530	100	7	PO4	none	equimolar	1b
531	10	7	PO4	sand	equimolar	1b
532	100	7	PO4	sand	equimolar	1b
533	10	7	PO4	none	ox	1b
534	100	7	PO4	none	ox	1b
535	10	7	PO4	sand	ox	1b
536	100	7	PO4	sand	ox	1b
537	10	7	PO4	none	equimolar	2a
538	100	7	PO4	none	equimolar	2a
539	10	7	PO4	sand	equimolar	2a
540	100	7	PO4	sand	equimolar	2a
541	10	7	PO4	none	ox	2a
542	100	7	PO4	none	ox	2a
543	10	7	PO4	sand	ox	2a
544	100	7	PO4	sand	ox	2a
545	10	7	PO4	none	equimolar	2b
546	100	7	PO4	none	equimolar	2b
547	10	7	PO4	sand	equimolar	2b
548	100	7	PO4	sand	equimolar	2b
549	10	7	PO4	none	ox	2b
550	100	7	PO4	none	ox	2b
551	10	7	PO4	sand	ox	2b
552	100	7	PO4	sand	ox	2b
553	10	7	PO4	none	equimolar	3a
554	100	7	PO4	none	equimolar	3a
555	10	7	PO4	sand	equimolar	3a
556	100	7	PO4	sand	equimolar	3a

Sample Key - 418 nm and 525 nm Spectrophotometric Measurement Samples

stabilization aids:
1a=214uL dowfax
1b=30uL dowfax
2a=200uL 50g/L NaHMP (pH'd)
2b=200uL 5g/L NaHMP (pH'd)
3a=200uL 50g/L Gum Arabic
3b=200uL 5g/L Gum Arabic
4a=200uL 0.5g/L xanthan gum
4b=500uL 0.5g/L xanthan gum

	Particle concentration (mg/L)	pH	Groundwater ionic content	Solids	Redox	Stabilization
557	10	7	PO4	none	ox	3a
558	100	7	PO4	none	ox	3a
559	10	7	PO4	sand	ox	3a
560	100	7	PO4	sand	ox	3a
561	10	7	PO4	none	equimolar	3b
562	100	7	PO4	none	equimolar	3b
563	10	7	PO4	sand	equimolar	3b
564	100	7	PO4	sand	equimolar	3b
565	10	7	PO4	none	ox	3b
566	100	7	PO4	none	ox	3b
567	10	7	PO4	sand	ox	3b
568	100	7	PO4	sand	ox	3b
569	10	7	PO4	none	equimolar	4a
570	100	7	PO4	none	equimolar	4a
571	10	7	PO4	sand	equimolar	4a
572	100	7	PO4	sand	equimolar	4a
573	10	7	PO4	none	ox	4a
574	100	7	PO4	none	ox	4a
575	10	7	PO4	sand	ox	4a
576	100	7	PO4	sand	ox	4a
577	10	7	PO4	none	equimolar	4b
578	100	7	PO4	none	equimolar	4b
579	10	7	PO4	sand	equimolar	4b
580	100	7	PO4	sand	equimolar	4b
581	10	7	PO4	none	ox	4b
582	100	7	PO4	none	ox	4b
583	10	7	PO4	sand	ox	4b
584	100	7	PO4	sand	ox	4b

"C" samples: note C = control samples - NO TCE

Appendix II. 525 nm Spectrophotometric Study Data

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
9A	0.359	0.356	0.356	0.361	0.374	0.371	0.362	0.356	0.302	0.258	0.246
9B	0.364	0.357	0.357	0.362	0.373	0.373	0.357	0.351	0.316	0.262	0.252
C9	0.371	0.371	0.371	0.371	0.369	0.368	0.37	0.37	0.367	0.363	0.36
10A	3.491	3.469	3.417	3.338	3.192	3.163	2.549	2.246	2.128	2.186	2.055
10B	3.485	3.467	3.415	3.32	3.169	3.043	2.546	2.372	2.078	2.107	2.069
C10	3.33	3.305	3.314	3.298	3.318	3.376	3.436	3.447	3.324	3.366	3.342
11A	0.368	0.369	0.37	0.371	0.374	0.375	0.371	0.353	0.294	0.248	0.243
11B	0.392	0.399	0.409	0.401	0.407	0.415	0.41	0.412	0.336	0.263	0.284
C11	0.373	0.373	0.374	0.373	0.373	0.373	0.371	0.371	0.37	0.37	0.368
12A	OVER	OVER	3.481	3.355	3.192	3.027	2.424	2.293	2.027	1.904	1.887
12B	3.483	3.494	3.43	3.264	3.035	2.926	2.303	2.067	1.935	1.992	1.919
C12	3.38	3.305	3.296	3.3	3.303	3.361	3.402	3.421	3.295	3.341	3.315
13A	0.365	0.365	0.363	0.376	0.383	0.382	0.369	0.36	0.307	0.249	0.224
13B	0.363	0.357	0.357	0.367	0.377	0.378	0.364	0.344	0.281	0.239	0.216
C13	0.376	0.374	0.374	0.373	0.373	0.371	0.372	0.372	0.371	0.37	0.366
14A	OVER	3.395	3.304	3.165	2.93	2.876	2.118	2.05	1.974	1.834	1.801
14B	OVER	3.384	3.271	3.123	2.875	2.64	2.14	1.923	1.795	1.74	1.751
C14	3.313	3.32	3.316	3.318	3.326	3.397	3.431	3.45	3.346	3.412	3.35
15A	0.372	0.371	0.37	0.368	0.37	0.376	0.378	0.37	0.354	0.3	0.278
15B	0.365	0.364	0.363	0.362	0.363	0.368	0.355	0.355	0.321	0.27	0.261
C15	0.369	0.369	0.369	0.368	0.368	0.367	0.366	0.365	0.364	0.364	0.362
16A	OVER	3.404	3.282	3.13	2.899	2.744	2.265	2.056	1.755	1.732	1.704
16B	OVER	3.353	3.235	3.075	2.813	2.561	2.062	1.967	1.865	1.822	1.807
C16	3.272	3.287	3.295	3.294	3.3	3.366	3.403	3.418	3.319	3.352	3.326
17A	0.367	0.36	0.356	0.363	0.359	0.341	0.31	0.265	0.173	0.087	0.081
17B	0.382	0.374	0.369	0.369	0.358	0.326	0.274	0.237	0.15	0.077	0.061
C17	0.383	0.378	0.372	0.36	0.34	0.311	0.267	0.234	0.192	0.131	0.121
18A	3.412	3.453	3.397	3.321	3.184	2.985	2.635	2.38	2.108	2.025	2.019
18B	3.408	3.438	3.39	3.303	3.176	2.971	2.626	2.392	2.107	2.057	2.081
C18	3.253	3.261	3.272	3.282	3.281	3.253	3.223	3.222	3.149	3.101	3.118
19A	0.402	0.398	0.394	0.388	0.376	0.357	0.335	0.304	0.201	0.142	0.131
19B	0.399	0.397	0.394	0.389	0.383	0.372	0.349	0.34	0.234	0.17	0.158
C19	0.395	0.393	0.39	0.388	0.382	0.373	0.356	0.357	0.326	0.309	0.318
20A	3.457	OVER	3.436	3.306	3.116	2.838	2.37	2.108	1.848	1.786	1.761
20B	3.411	3.488	3.41	3.266	3.096	2.883	2.398	2.133	1.887	1.826	1.801
C20	3.292	3.295	3.299	3.308	3.31	3.307	3.309	3.285	3.216	3.213	3.235
21A	0.367	0.361	0.357	0.366	0.355	0.332	0.285	0.255	0.132	0.06	0.069
21B	0.376	0.37	0.367	0.376	0.368	0.346	0.302	0.253	0.154	0.072	0.051
C21	0.386	0.381	0.377	0.37	0.356	0.329	0.294	0.266	0.216	0.182	0.167
22A	3.462	3.396	3.249	3.081	2.851	2.557	1.996	1.736	1.461	1.385	1.358
22B	3.45	3.412	3.254	3.085	2.846	2.608	2.027	1.757	1.479	1.406	1.379
C22	3.272	3.284	3.28	3.287	3.29	3.257	3.223	3.178	3.105	3.063	3.042
23A	0.395	0.392	0.385	0.381	0.37	0.354	0.327	0.315	0.205	0.151	0.145
23B	0.392	0.388	0.383	0.377	0.364	0.344	0.319	0.31	0.196	0.135	0.147
C23	0.4	0.397	0.395	0.393	0.385	0.369	0.352	0.347	0.313	0.307	0.316
24A	3.46	3.44	3.256	3.091	2.863	2.529	2.068	1.83	1.561	1.484	1.506
24B	3.442	3.397	3.247	3.087	2.864	2.534	2.047	1.798	1.541	1.483	1.484
C24	3.297	3.297	3.305	3.325	3.31	3.311	3.281	3.284	3.218	3.2	3.231
25A	0.753	0.755	0.763	0.772	0.778	0.778	0.772	0.757	0.735	0.623	0.608
25B	0.744	0.746	0.754	0.765	0.77	0.768	0.761	0.754	0.711	0.605	0.586
C25	0.76	0.76	0.76	0.761	0.76	0.76	0.761	0.759	0.759	0.754	0.748
26A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
26B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C26	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
27A	0.749	0.75	0.75	0.753	0.759	0.726	0.758	0.746	0.699	0.595	0.573
27B	0.763	0.762	0.763	0.768	0.773	0.774	0.769	0.76	0.706	0.6	0.576
C27	0.755	0.757	0.757	0.757	0.757	0.757	0.757	0.755	0.754	0.753	0.751
28A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
28B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C28	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
29A	0.725	0.728	0.74	0.751	0.755	0.747	0.736	0.727	0.659	0.553	0.533
29B	0.724	0.73	0.742	0.753	0.758	0.751	0.74	0.727	0.657	0.552	0.532
C29	0.734	0.734	0.733	0.733	0.732	0.733	0.733	0.734	0.734	0.73	0.727
30A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
30B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C30	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
31A	0.741	0.74	0.739	0.74	0.745	0.75	0.748	0.746	0.698	0.585	0.569
31B	0.739	0.739	0.738	0.74	0.744	0.753	0.746	0.738	0.692	0.584	0.568
C31	0.752	0.752	0.748	0.75	0.75	0.749	0.75	0.748	0.746	0.746	0.743
32A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
32B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C32	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
33A	0.751	0.744	0.745	0.747	0.738	0.705	0.642	0.606	0.5	0.405	0.415
33B	0.746	0.738	0.74	0.743	0.734	0.707	0.651	0.609	0.519	0.431	0.4
C33	0.754	0.747	0.745	0.736	0.719	0.688	0.64	0.621	0.557	0.463	0.452
34A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
34B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C34	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
35A	0.771	0.766	0.766	0.757	0.755	0.739	0.708	0.676	0.605	0.537	0.555
35B	0.763	0.761	0.758	0.752	0.749	0.738	0.705	0.674	0.572	0.518	0.532
C35	0.766	0.762	0.761	0.757	0.756	0.742	0.728	0.716	0.693	0.67	0.695
36A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
36B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C36	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
37A	0.736	0.737	0.747	0.741	0.73	0.689	0.611	0.556	0.408	0.305	0.301
37B	0.744	0.738	0.747	0.744	0.734	0.693	0.611	0.553	0.405	0.317	0.29
C37	0.762	0.757	0.752	0.741	0.728	0.699	0.652	0.62	0.56	0.504	0.475

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
38A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.485	OVER	OVER
38B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C38	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
39A	0.758	0.754	0.75	0.745	0.738	0.723	0.68	0.672	0.55	0.491	0.524
39B	0.764	0.762	0.76	0.754	0.752	0.742	0.728	0.709	0.608	0.549	0.561
C39	0.76	0.759	0.756	0.754	0.751	0.743	0.729	0.718	0.698	0.671	0.688
40A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.497	OVER	OVER
40B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C40	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
41A	0.247	0.207	0.175	0.107	0.03	0.009	0.007	0.007	0.007	0.007	0.008
41B	0.235	0.192	0.159	0.09	0.017	0.001	0.001	0.002	0.002	0.003	0.003
C41	0.255	0.212	0.188	0.115	0.035	0.006	0.007	0.005	0.006	0.008	0.009
42A	3.254	3.311	3.337	3.372	3.256	3.206	0.441	0.295	0.081	0.019	0.011
42B	3.364	3.453	3.48	OVER	3.415	1.252	0.527	0.348	0.094	0.037	0.015
C42	3.269	3.322	3.357	3.43	3.496	3.37	2.976	2.752	1.681	0.643	0.293
43A	0.342	0.341	0.339	0.337	0.333	0.328	0.324	0.313	0.107	0.049	0.027
43B	0.341	0.339	0.337	0.334	0.332	0.327	0.322	0.314	0.106	0.049	0.025
C43	0.345	0.343	0.34	0.338	0.334	0.33	0.327	0.323	0.135	0.059	0.022
44A	3.247	3.246	3.26	3.295	3.369	3.454	3.405	OVER	0.417	0.185	0.089
44B	3.183	3.178	3.184	3.201	3.278	3.356	3.324	1.847	0.55	0.185	0.084
C44	3.229	3.238	3.226	3.238	3.267	3.236	3.284	3.088	2.774	2.44	2.202
45A	0.244	0.199	0.15	0.097	0.026	0.008	0.007	0.006	0.006	0.007	0.008
45B	0.237	0.193	0.146	0.092	0.019	0.003	0.001	0.001	0.001	0.003	0.003
C45	0.236	0.193	0.149	0.098	0.022	0.002	0.002	0.002	0.002	0.003	0.004
46A	3.447	3.452	3.361	3.125	1.647	0.814	0.467	0.314	0.125	0.047	0.013
46B	3.375	3.389	3.282	3.037	1.632	0.767	0.456	0.308	0.133	0.04	0.011
C46	3.285	3.307	3.339	3.377	3.436	3.032	0.773	0.332	0.129	0.072	0.036
47A	0.333	0.329	0.325	0.322	0.317	0.315	0.329	0.312	0.096	0.035	0.016
47B	0.332	0.327	0.323	0.32	0.316	0.312	0.308	0.304	0.077	0.041	0.017
C47	0.334	0.331	0.326	0.323	0.318	0.314	0.31	0.302	0.095	0.036	0.021
48A	3.289	3.318	3.317	3.239	2.333	1.18	0.567	0.342	0.111	0.036	0.014
48B	3.231	3.265	3.263	3.183	2.304	1.2	0.556	0.459	0.128	0.058	0.044
C48	3.212	3.206	3.195	3.208	3.212	3.207	3.24	3.241	3.165	2.851	2.791
49A	0.285	0.242	0.195	0.134	0.048	0.027	0.021	0.02	0.017	0.012	0.013
49B	0.281	0.239	0.189	0.127	0.044	0.025	0.022	0.019	0.016	0.012	0.012
C49	0.298	0.256	0.208	0.149	0.059	0.034	0.03	0.031	0.026	0.02	0.019
50A	3.256	3.341	3.452	OVER	3.415	3.082	2.257	1.369	0.407	0.103	0.046
50B	3.242	3.304	3.383	3.389	3.319	2.84	1.523	1.021	0.524	0.177	0.108
C50	3.275	3.307	3.359	3.414	3.474	3.452	2.938	2.286	1.397	0.626	0.291
51A	0.377	0.373	0.37	0.364	0.353	0.32	0.233	0.17	0.09	0.043	0.025
51B	0.37	0.367	0.363	0.359	0.348	0.317	0.23	0.163	0.093	0.043	0.026
C51	0.372	0.369	0.365	0.36	0.352	0.325	0.234	0.177	0.093	0.046	0.026
52A	3.249	3.283	3.321	3.353	3.452	3.489	3.124	1.774	0.82	0.462	0.265
52B	3.263	3.281	3.316	3.353	3.415	3.284	2.648	1.803	0.803	0.709	0.7
C52	3.228	3.21	3.202	3.194	3.185	3.132	3.005	2.91	2.669	2.276	1.962
53A	0.264	0.222	0.174	0.113	0.038	0.025	0.022	0.02	0.017	0.012	0.013
53B	0.285	0.243	0.196	0.134	0.05	0.033	0.029	0.027	0.024	0.016	0.016
C53	0.287	0.245	0.199	0.139	0.054	0.038	0.032	0.032	0.028	0.022	0.021
54A	OVER	OVER	3.418	3.125	2.057	0.765	0.443	0.461	0.303	0.097	0.083
54B	3.475	3.496	3.404	3.064	2.187	0.724	0.477	0.423	0.237	0.101	0.041
C54	3.298	3.308	3.355	3.385	3.407	2.367	1.037	0.624	0.486	0.395	0.179
55A	0.378	0.375	0.371	0.363	0.347	0.306	0.199	0.141	0.101	0.036	0.024
55B	0.375	0.371	0.365	0.356	0.339	0.284	0.176	0.129	0.089	0.05	0.035
C55	0.37	0.363	0.354	0.349	0.33	0.285	0.195	0.144	0.093	0.051	0.036
56A	3.423	3.435	3.492	3.416	2.933	1.513	0.691	0.44	0.184	0.079	0.062
56B	3.325	3.38	3.422	3.379	2.814	1.379	0.722	0.404	0.318	0.172	0.12
C56	3.23	3.257	3.268	3.267	3.234	3.229	3.195	3.173	3.104	3.023	2.852
57A	0.565	0.516	0.482	0.503	0.662	0.52	0.203	0.145	0.051	0.007	0.002
57B	0.562	0.512	0.477	0.506	0.662	0.5	0.198	0.146	0.054	0.006	0.002
C57	0.555	0.509	0.472	0.451	0.658	0.564	0.275	0.187	0.06	0.008	0.002
58A	OVER	OVER	OVER	OVER	OVER	OVER	3.365	2.815	1.505	0.803	0.412
58B	OVER	OVER	OVER	OVER	OVER	OVER	3.253	2.594	1.253	0.747	0.321
C58	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.183	2.496	0.596
59A	0.688	0.684	0.68	0.676	0.668	0.652	0.63	0.547	0.235	0.103	0.044
59B	0.686	0.683	0.682	0.677	0.669	0.657	0.627	0.52	0.229	0.088	0.044
C59	0.694	0.69	0.688	0.684	0.676	0.664	0.607	0.55	0.395	0.21	0.106
60A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.184	2.54	1.699
60B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.348	2.88	1.967
C60	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
61A	0.547	0.505	0.483	0.572	0.669	0.469	0.173	0.136	0.052	0.011	0.002
61B	0.548	0.507	0.483	0.569	0.663	0.367	0.165	0.131	0.047	0.009	0.002
C61	0.548	0.506	0.474	0.503	0.68	0.542	0.225	0.155	0.053	0.01	0.001
62A	OVER	OVER	OVER	OVER	2.948	1.578	0.414	0.321	0.191	0.109	0.02
62B	OVER	OVER	OVER	OVER	2.999	1.476	0.434	0.407	0.185	0.115	0.03
C62	OVER	OVER	OVER	OVER	OVER	OVER	3.255	2.922	2.258	1.689	1.074
63A	0.678	0.671	0.668	0.663	0.65	0.625	0.476	0.431	0.198	0.063	0.027
63B	0.664	0.658	0.656	0.652	0.643	0.623	0.48	0.414	0.164	0.06	0.029
C63	0.663	0.657	0.655	0.65	0.64	0.672	0.521	0.485	0.365	0.213	0.107
64A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.397	2.814	2.096	1.21
64B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.267	2.71	2.074	1.199
C64	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
65A	0.636	0.514	0.517	0.553	0.679	0.612	0.299	0.166	0.038	0.009	0.007
65B	0.624	0.549	0.5	0.52	0.675	0.596	0.349	0.175	0.048	0.009	0.005
C65	0.641	0.567	0.514	0.484	0.651	0.581	0.243	0.138	0.039	0.008	0.005
66A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.345	1.728	1.692	3.001
66B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.049	1.783	2.23	2.305
C66	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.528	1.967	1.304

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
67A	0.727	0.718	0.711	0.701	0.678	0.614	0.471	0.361	0.196	0.117	0.08
67B	0.715	0.708	0.703	0.696	0.685	0.661	0.523	0.438	0.234	0.143	0.028
C67	0.722	0.716	0.708	0.699	0.677	0.62	0.477	0.378	0.231	0.145	0.118
68A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.003	1.983
68B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.957	2.252
C68	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
69A	0.628	0.554	0.508	0.598	0.648	0.474	0.192	0.112	0.03	0.012	0.01
69B	0.616	0.544	0.518	0.654	0.673	0.491	0.225	0.121	0.034	0.009	0.006
C69	0.635	0.566	0.523	0.588	0.688	0.613	0.284	0.134	0.034	0.009	0.008
70A	OVER	OVER	OVER	OVER	OVER	2.232	1.281	1.165	0.576	0.733	0.333
70B	OVER	OVER	OVER	OVER	OVER	2.419	1.118	0.703	0.462	0.273	0.192
C70	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.419	1.554	1.564
71A	0.701	0.691	0.683	0.671	0.654	0.62	0.453	0.375	0.185	0.082	0.04
71B	0.725	0.714	0.708	0.698	0.673	0.601	0.419	0.346	0.177	0.084	0.049
C71	0.701	0.699	0.694	0.683	0.666	0.641	0.503	0.437	0.313	0.209	0.107
72A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.245	2.883	2.396
72B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.122	2.462	2.264
C72	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
73A	0.356	0.353	0.356	0.362	0.369	0.37	0.368	0.353	0.24	0.178	0.158
73B	0.355	0.35	0.358	0.361	0.37	0.373	0.366	0.356	0.243	0.179	0.162
C73	0.361	0.36	0.361	0.36	0.363	0.362	0.358	0.359	0.352	0.339	0.328
74A	OVER	3.497	3.421	3.229	3.054	2.873	2.18	1.947	1.743	1.703	1.687
74B	OVER	OVER	3.401	3.214	3.043	2.864	2.188	1.886	1.733	1.694	1.676
C74	3.318	3.326	3.334	3.341	3.343	3.343	3.338	3.329	3.336	3.311	3.302
75A	0.365	0.358	0.364	0.368	0.367	0.35	0.331	0.302	0.186	0.103	0.066
75B	0.367	0.36	0.364	0.37	0.367	0.349	0.334	0.302	0.179	0.103	0.076
C75	0.371	0.366	0.363	0.361	0.355	0.34	0.341	0.333	0.289	0.234	0.197
76A	OVER	OVER	3.403	3.211	2.994	2.65	2.007	1.761	1.598	1.504	1.452
76B	OVER	OVER	3.37	3.17	2.925	2.643	1.971	1.73	1.563	1.462	1.416
C76	3.334	3.342	3.336	3.32	3.317	3.305	3.317	3.303	3.269	3.203	3.191
77A	0.253	0.19	0.158	0.088	0.011	0.002	0	0	0.002	0.003	0.003
77B	0.247	0.181	0.15	0.079	0.012	0.008	0.002	0.01	0.005	0.006	0.006
C77	0.248	0.189	0.16	0.093	0.017	0.005	0.003	0.004	0.005	0.006	0.007
78A	3.323	OVER	OVER	OVER	3.353	2.834	0.692	0.39	0.095	0.021	0.006
78B	3.267	3.412	3.44	3.499	3.307	2.876	0.67	0.379	0.101	0.026	0.006
C78	3.255	3.322	3.351	3.432	OVER	OVER	3.372	3.148	2.907	1.711	0.966
79A	0.291	0.225	0.195	0.123	0.038	0.023	0.016	0.015	0.013	0.012	0.01
79B	0.302	0.249	0.221	0.15	0.047	0.022	0.012	0.012	0.013	0.012	0.011
C79	0.286	0.221	0.191	0.121	0.037	0.025	0.019	0.019	0.016	0.011	0.01
80A	3.243	3.307	3.313	3.349	3.261	1.149	0.888	2.13	2.698	1.912	1.917
80B	3.257	3.325	3.319	3.381	3.177	1.313	OVER	OVER	2.803	2.486	2.603
C80	3.27	3.339	3.353	3.433	OVER	3.458	3	2.555	1.402	0.696	0.344
81A	0.349	0.334	0.324	0.324	0.358	0.352	0.317	0.264	0.131	0.028	0.008
81B	0.34	0.325	0.314	0.312	0.343	0.333	0.287	0.22	0.057	0.009	0.003
C81	0.341	0.329	0.32	0.306	0.35	0.348	0.318	0.259	0.117	0.026	0.007
82A	3.199	3.264	3.307	3.343	3.373	2.491	1.417	OVER	0.368	0.16	0.01
82B	3.217	3.272	3.313	3.367	3.394	2.743	2.037	0.55	0.199	0.143	0.025
C82	3.221	3.234	3.249	3.271	3.289	3.324	3.265	2.185	1.16	0.73	0.339
83A	0.38	0.359	0.345	0.326	0.366	0.324	0.267	0.205	0.108	0.057	0.026
83B	0.37	0.356	0.341	0.321	0.357	0.321	0.286	0.239	0.131	0.055	0.021
C83	0.377	0.363	0.351	0.327	0.362	0.362	0.32	0.274	0.153	0.057	0.017
84A	3.282	3.403	3.486	OVER	OVER	2.617	1.315	0.696	0.413	0.307	0.224
84B	3.279	3.393	3.461	OVER	OVER	2.424	1.498	0.596	0.461	0.3231	0.259
C84	3.265	3.283	3.282	3.313	3.319	3.3	3.017	2.253	1.123	0.811	0.651
85A	0.701	0.688	0.695	0.703	0.702	0.695	0.662	0.281	0.112	0.016	0.004
85B	0.694	0.686	0.691	0.701	0.699	0.689	0.65	0.275	0.101	0.015	0.004
C85	0.714	0.704	0.705	0.715	0.719	0.715	0.695	0.427	0.143	0.031	0.006
86A	OVER	OVER	OVER	OVER	OVER	OVER	3.311	2.937	1.877	0.779	0.367
86B	OVER	OVER	OVER	OVER	OVER	OVER	3.432	2.828	1.939	0.707	0.33
C86	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.367	2.962
87A	0.736	0.712	0.706	0.704	0.686	0.636	0.416	0.219	0.078	0.016	0.007
87B	0.737	0.715	0.711	0.707	0.692	0.637	0.379	0.2	0.095	0.023	0.008
C87	0.754	0.739	0.733	0.752	0.754	0.722	0.647	0.359	0.158	0.044	0.017
88A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.859	2.107	1.291	0.642
88B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.868	2.139	1.302	0.682
C88	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.49
89A	0.341	0.327	0.317	0.334	0.353	0.348	0.305	0.248	0.094	0.024	0.008
89B	0.336	0.321	0.309	0.324	0.342	0.334	0.285	0.222	0.057	0.011	0.005
C89	0.343	0.332	0.321	0.308	0.351	0.358	0.333	0.275	0.129	0.033	0.011
90A	3.243	3.348	3.408	3.441	3.426	2.484	2.346	0.251	0.079	0.026	0.012
90B	3.188	3.285	3.323	3.356	3.343	2.357	1.998	0.154	0.079	0.008	0.003
C90	3.251	3.298	3.299	3.319	3.333	3.376	3.367	2.55	1.37	0.794	0.559
91A	0.365	0.343	0.323	0.307	0.321	0.289	0.228	0.15	0.06	0.018	0.013
91B	0.385	0.362	0.343	0.329	0.342	0.311	0.233	0.161	0.074	0.029	0.018
C91	0.38	0.362	0.347	0.329	0.354	0.369	0.301	0.247	0.153	0.068	0.038
92A	3.283	3.473	OVER	OVER	3.36	1.772	0.877	0.809	0.591	0.426	0.345
92B	3.303	3.477	OVER	OVER	3.323	1.798	0.881	0.527	0.378	0.28	0.239
C92	3.253	3.268	3.279	3.292	3.293	3.282	3.01	2.222	1.294	0.907	0.652
93A	0.355	0.347	0.342	0.332	0.317	0.293	0.268	0.256	0.231	0.217	0.214
93B	0.355	0.351	0.343	0.332	0.316	0.293	0.267	0.253	0.227	0.212	0.205
C93	0.36	0.359	0.358	0.355	0.355	0.353	0.349	0.35	0.347	0.344	0.341
94A	2.902	2.75	2.614	2.433	2.23	2.087	2.114	2.129	2.169	2.202	2.186
94B	2.926	2.764	2.63	2.443	2.238	2.106	2.13	2.142	2.187	2.227	2.217
C94	3.106	3.127	3.174	3.239	3.282	3.294	3.287	3.271	3.202	3.172	3.034
95A	0.39	0.381	0.377	0.361	0.342	0.309	0.265	0.24	0.178	0.134	0.114
95B	0.4	0.392	0.384	0.37	0.35	0.318	0.27	0.239	0.171	0.131	0.115
C95	0.458	0.452	0.448	0.444	0.436	0.413	0.379	0.354	0.281	0.212	0.174

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
96A	2.939	2.78	2.638	2.419	2.193	2.148	2.137	2.149	2.137	2.139	2.122
96B	2.94	2.789	2.635	2.427	2.204	2.151	2.149	2.135	2.106	2.086	2.07
C96	3.158	3.214	3.232	3.3	3.326	3.318	3.286	3.267	3.131	3.096	2.919
97A	0.711	0.701	0.693	0.677	0.655	0.629	0.602	0.592	0.576	0.571	0.571
97B	0.717	0.708	0.7	0.684	0.66	0.635	0.609	0.596	0.579	0.575	0.572
C97	0.729	0.73	0.729	0.728	0.726	0.722	0.719	0.721	0.72	0.715	0.711
98A	3.415	3.5	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.219
98B	3.408	3.496	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.275
C98	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.261
99A	0.754	0.742	0.728	0.706	0.677	0.633	0.574	0.544	0.462	0.404	0.381
99B	0.756	0.745	0.733	0.711	0.682	0.641	0.585	0.549	0.459	0.391	0.36
C99	0.777	0.776	0.77	0.765	0.755	0.733	0.692	0.662	0.58	0.504	0.463
100A	3.458	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.195
100B	3.444	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.257
C100	3.48	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.233
101A	0.367	0.362	0.357	0.345	0.331	0.329	0.344	0.342	0.29	0.234	0.216
101B	0.357	0.353	0.347	0.336	0.327	0.321	0.335	0.333	0.288	0.227	0.219
C101	0.37	0.368	0.368	0.366	0.366	0.364	0.364	0.363	0.362	0.365	0.363
102A	2.942	2.992	3.08	3.251	3.319	3.212	2.42	2.223	2.014	1.962	1.971
102B	2.959	3.026	3.118	3.288	3.383	3.233	2.412	2.212	2.018	1.973	1.968
C102	3.074	3.167	3.165	3.315	3.37	3.384	3.429	3.382	3.108	3.008	3.057
103A	0.386	0.375	0.366	0.346	0.326	0.311	0.334	0.325	0.198	0.133	0.112
103B	0.386	0.376	0.365	0.348	0.33	0.32	0.338	0.324	0.202	0.12	0.09
C103	0.393	0.384	0.38	0.373	0.363	0.336	0.354	0.345	0.308	0.232	0.212
104A	2.955	3.021	3.108	3.235	3.247	2.797	2.253	2.052	1.83	1.727	1.706
104B	2.935	3.012	3.087	3.223	3.245	2.767	2.278	2.035	1.809	1.73	1.692
C104	3.083	3.129	3.202	3.3	3.363	3.365	3.391	3.364	3.112	2.926	2.987
105A	0.726	0.716	0.707	0.693	0.683	0.698	0.715	0.707	0.678	0.596	0.57
105B	0.73	0.718	0.708	0.694	0.683	0.7	0.717	0.708	0.678	0.593	0.574
C105	0.731	0.73	0.733	0.733	0.731	0.728	0.729	0.728	0.733	0.733	0.723
106A	3.263	3.419	OVER	OVER	OVER	OVER	OVER	OVER	3.326	3.162	3.212
106B	3.337	3.415	OVER	OVER	OVER	OVER	OVER	OVER	3.324	3.149	3.2
C106	3.289	3.371	3.445	OVER	OVER	OVER	OVER	OVER	3.179	3.166	3.246
107A	0.755	0.739	0.724	0.702	0.689	0.686	0.669	0.677	0.546	0.491	0.45
107B	0.749	0.731	0.716	0.696	0.685	0.682	0.664	0.661	0.509	0.447	0.423
C107	0.762	0.756	0.749	0.746	0.736	0.72	0.699	0.719	0.665	0.61	0.576
108A	3.33	3.471	OVER	OVER	OVER	OVER	OVER	OVER	3.341	3.153	3.215
108B	3.339	3.465	OVER	OVER	OVER	OVER	OVER	OVER	3.441	3.165	3.23
C108	3.293	3.372	3.436	OVER	OVER	OVER	OVER	OVER	3.396	3.207	3.276
109A	0.351	0.341	0.33	0.314	0.284	0.248	0.206	0.187	0.149	0.124	0.114
109B	0.354	0.344	0.334	0.318	0.289	0.254	0.212	0.192	0.155	0.13	0.121
C109	0.361	0.362	0.36	0.36	0.36	0.357	0.357	0.356	0.354	0.353	0.351
110A	2.762	2.41	2.119	1.77	1.71	1.826	1.962	1.976	2.028	2.08	2.099
110B	2.755	2.403	2.111	1.767	1.716	1.831	1.92	1.977	2.039	2.092	2.111
C110	3.065	3.101	3.13	3.222	3.314	3.354	3.4	3.382	3.134	3.115	3.133
111A	0.365	0.354	0.342	0.324	0.291	0.245	0.126	0.155	0.088	0.076	0.058
111B	0.372	0.356	0.345	0.326	0.293	0.247	0.19	0.165	0.1	0.088	0.071
C111	0.377	0.376	0.376	0.37	0.364	0.352	0.328	0.324	0.267	0.287	0.256
112A	2.747	2.387	2.081	1.73	1.762	1.874	1.954	2.001	1.954	2.082	2.067
112B	2.737	2.375	2.029	1.723	1.741	1.867	1.964	1.982	1.984	2.061	1.932
C112	3.061	3.086	3.116	3.203	3.289	3.313	3.312	3.292	3.054	3.045	3.043
113A	0.35	0.34	0.329	0.31	0.301	0.323	0.324	0.307	0.223	0.094	0.058
113B	0.351	0.343	0.329	0.312	0.301	0.323	0.328	0.315	0.235	0.126	0.08
C113	0.357	0.358	0.356	0.356	0.357	0.355	0.354	0.353	0.354	0.356	0.353
114A	2.843	2.944	3.013	3.063	2.97	1.339	0.755	0.581	0.318	0.224	0.212
114B	2.782	2.873	2.929	2.977	2.886	1.366	0.759	0.569	0.331	0.239	0.206
C114	3.058	3.087	3.118	3.208	3.313	3.348	3.375	3.364	3.12	3.091	3.119
115A	0.367	0.354	0.34	0.319	0.31	0.313	0.282	0.247	0.132	0.058	0.03
115B	0.37	0.355	0.34	0.32	0.316	0.319	0.287	0.247	0.127	0.052	0.027
C115	0.386	0.382	0.38	0.374	0.37	0.358	0.342	0.317	0.286	0.301	0.274
116A	2.821	2.913	2.969	2.96	2.61	1.269	0.634	0.431	0.154	0.075	0.07
116B	2.792	2.897	2.947	2.943	2.615	1.224	0.642	0.417	0.146	0.061	0.051
C116	3.063	3.083	3.152	3.219	3.307	3.314	3.312	3.287	3.074	3.025	3.08
117A	0.317	0.295	0.281	0.266	0.241	0.208	0.164	0.146	0.127	0.097	0.077
117B	0.316	0.294	0.282	0.268	0.241	0.208	0.164	0.146	0.127	0.095	0.074
C117	0.317	0.3	0.293	0.287	0.275	0.259	0.234	0.199	0.161	0.12	0.096
118A	2.849	2.649	2.466	2.253	1.868	1.57	1.457	1.392	1.295	1.161	1.076
118B	2.823	2.591	2.41	2.194	1.817	1.532	1.424	1.352	1.259	1.13	1.049
C118	3.013	3.026	3.07	3.155	3.214	3.09	2.534	1.872	1.654	1.544	1.487
119A	0.343	0.32	0.303	0.287	0.257	0.226	0.194	0.179	0.159	0.108	0.056
119B	0.352	0.327	0.31	0.291	0.261	0.223	0.195	0.183	0.164	0.131	0.107
C119	0.349	0.329	0.32	0.309	0.289	0.264	0.227	0.219	0.202	0.163	0.136
120A	2.862	2.645	2.454	2.236	1.859	1.572	1.467	1.409	1.32	1.203	1.121
120B	2.841	2.641	2.434	2.224	1.855	1.564	1.456	1.386	1.292	1.165	1.092
C120	3.037	3.08	3.102	3.165	3.213	3.074	2.584	2.038	1.776	1.663	1.56
121A	0.662	0.633	0.614	0.592	0.556	0.482	0.39	0.341	0.3	0.245	0.209
121B	0.676	0.641	0.619	0.595	0.557	0.486	0.403	0.344	0.305	0.25	0.213
C121	0.672	0.657	0.647	0.641	0.626	0.597	0.536	0.455	0.374	0.305	0.261
122A	3.282	3.437	OVER	OVER	OVER	OVER	3.365	3.243	3.017	2.848	2.802
122B	3.332	3.458	OVER	OVER	OVER	OVER	3.36	3.253	3.019	2.851	2.798
C122	3.227	3.379	3.468	OVER	OVER	OVER	OVER	OVER	3.299	3.193	3.197
123A	0.683	0.651	0.632	0.608	0.57	0.499	0.425	0.386	0.345	0.284	0.235
123B	0.698	0.667	0.646	0.624	0.589	0.514	0.446	0.409	0.374	0.32	0.258
C123	0.706	0.689	0.677	0.669	0.653	0.611	0.542	0.51	0.444	0.376	0.324
124A	3.331	3.491	OVER	OVER	OVER	OVER	3.333	3.233	3.045	2.91	2.859
124B	3.319	3.447	OVER	OVER	OVER	OVER	3.337	3.234	3.017	2.852	2.807
C124	3.307	3.414	OVER	OVER	OVER	OVER	OVER	OVER	3.483	3.323	3.294

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
125A	0.357	0.349	0.343	0.329	0.309	0.286	0.262	0.248	0.197	0.14	0.105
125B	0.36	0.353	0.345	0.332	0.31	0.286	0.263	0.245	0.196	0.138	0.105
C125	0.37	0.368	0.368	0.366	0.362	0.359	0.354	0.35	0.347	0.344	0.279
126A	3.001	2.889	2.868	2.77	2.65	2.475	2.268	2.107	1.903	1.677	1.554
126B	3.004	2.887	2.842	2.765	2.634	2.461	2.236	2.074	1.877	1.672	1.559
C126	3.147	3.142	3.188	3.296	3.393	3.407	3.365	3.27	2.655	2.084	1.962
127A	0.379	0.368	0.358	0.342	0.316	0.293	0.268	0.258	0.226	0.175	0.136
127B	0.392	0.379	0.368	0.35	0.323	0.3	2.73	0.268	0.245	0.2	0.148
C127	0.387	0.38	0.376	0.372	0.359	0.334	0.292	0.271	0.237	0.267	0.226
128A	3.011	2.909	2.858	2.761	2.637	2.463	2.197	2.068	1.872	1.701	1.536
128B	3.004	2.899	2.842	2.763	2.629	2.443	2.181	2.069	1.894	1.735	1.635
C128	3.149	3.15	3.168	3.286	3.326	3.294	3.193	3.049	2.444	2.077	1.963
129A	0.724	0.707	0.692	0.672	0.651	0.625	0.609	0.578	0.489	0.375	0.311
129B	0.722	0.71	0.695	0.675	0.651	0.628	0.617	0.597	0.509	0.378	0.32
C129	0.724	0.724	0.724	0.721	0.716	0.712	0.703	0.703	0.694	0.719	0.655
130A	3.448	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.415	0.398	0.165
130B	3.479	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.461	0.219	0.244
C130	3.46	3.46	OVER	OVER	OVER	OVER	OVER	OVER	3.372	1.442	0.838
131A	0.739	0.721	0.706	0.684	0.665	0.628	0.595	0.595	0.549	0.446	0.377
131B	0.739	0.718	0.703	0.679	0.655	0.619	0.581	0.577	0.522	0.418	0.332
C131	0.767	0.756	0.746	0.738	0.722	0.675	0.626	0.599	0.555	0.645	0.551
132A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.69	0.426	0.327
132B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.565	0.35	0.242
C132	3.436	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.813	1.162
133A	0.316	0.294	0.277	0.252	0.216	0.178	0.145	0.131	0.114	0.093	0.08
133B	0.316	0.294	0.277	0.252	0.217	0.181	0.145	0.131	0.115	0.094	0.078
C133	0.332	0.318	0.31	0.3	0.288	0.273	0.247	0.217	0.176	0.143	0.123
134A	2.804	2.453	2.195	1.849	1.545	1.413	1.311	1.239	1.132	1.004	0.93
134B	2.813	2.459	2.206	1.859	1.56	1.425	1.324	1.252	1.14	1.007	0.933
C134	3.145	3.148	3.16	3.226	3.29	3.179	2.628	1.987	1.695	1.591	1.534
135A	0.333	0.31	0.293	0.265	0.229	0.196	0.166	0.153	0.136	0.111	0.094
135B	0.338	0.315	0.297	0.265	0.228	0.195	0.169	0.167	0.131	0.105	0.099
C135	0.345	0.329	0.32	0.303	0.284	0.287	0.265	0.217	0.198	0.175	0.156
136A	2.817	2.482	2.226	1.887	1.588	1.454	1.35	1.286	1.175	1.049	0.977
136B	2.788	2.458	2.205	1.865	1.569	1.433	1.33	1.26	1.152	1.033	0.968
C136	3.154	3.156	3.18	3.234	3.256	3.128	2.674	2.152	1.81	1.683	1.609
137A	0.351	0.337	0.326	0.302	0.268	0.246	0.218	0.179	0.165	0.134	0.109
137B	0.349	0.337	0.324	0.301	0.267	0.243	0.216	0.185	0.158	0.126	0.106
C137	0.363	0.361	0.359	0.358	0.355	0.352	0.346	0.342	0.336	0.327	0.321
138A	2.886	2.722	2.639	2.56	2.488	2.294	2.098	1.981	1.816	1.641	1.528
138B	2.9	2.74	2.655	32.573	2.52	2.326	2.122	2.007	1.84	1.657	1.547
C138	3.178	3.221	3.215	3.29	3.385	3.423	3.417	3.321	2.77	2.123	1.984
139A	0.377	0.36	0.345	0.318	0.288	0.265	0.241	0.221	0.191	0.16	0.125
139B	0.372	0.355	0.34	0.312	0.279	0.248	0.22	0.203	0.174	0.15	0.136
C139	0.391	0.388	0.385	0.371	0.362	0.333	0.292	0.272	0.259	0.249	0.239
140A	2.902	2.745	2.654	2.577	2.516	2.3	2.109	2.012	1.838	1.67	1.561
140B	2.895	2.742	2.652	2.551	2.485	2.283	2.107	2.019	1.851	1.675	1.565
C140	3.182	3.179	3.193	3.268	3.345	3.32	3.22	3.135	2.561	2.056	1.939
141A	0.367	0.363	0.36	0.358	0.356	0.352	0.354	0.358	0.363	0.372	0.376
141B	0.366	0.361	0.358	0.358	0.352	0.349	0.352	0.355	0.361	0.375	0.374
C141	0.365	0.364	0.363	0.361	0.359	0.356	0.355	0.355	0.353	0.349	0.347
142A	3.244	3.297	3.378	OVER	OVER	OVER	OVER	OVER	2.201	1.822	1.728
142B	3.251	3.288	3.344	OVER	OVER	OVER	OVER	OVER	2.268	1.823	1.704
C142	3.344	3.303	3.258	3.406	3.24	3.487	OVER	3.472	3.235	2.939	2.769
143A	0.386	0.379	0.378	0.376	0.365	0.347	0.321	0.322	0.304	0.364	0.371
143B	0.383	0.377	0.372	0.368	0.362	0.334	0.308	0.322	0.306	0.337	0.366
C143	0.393	0.388	0.384	0.377	0.366	0.338	0.297	0.307	0.254	0.25	0.24
144A	3.27	3.323	3.374	OVER	OVER	OVER	OVER	3.372	1.916	1.575	1.485
144B	3.315	3.319	3.421	OVER	OVER	OVER	OVER	3.233	1.822	1.666	1.544
C144	3.307	3.239	3.299	3.344	3.224	3.384	3.393	3.362	3.19	2.894	2.66
145A	0.73	0.727	0.727	0.723	0.716	0.718	0.721	0.727	0.733	0.736	0.725
145B	0.72	0.717	0.716	0.712	0.709	0.709	0.711	0.718	0.724	0.727	0.716
C145	0.728	0.724	0.726	0.721	0.719	0.722	0.717	0.714	0.713	0.71	0.71
146A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.138	2.824
146B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.081	2.893
C146	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.14	2.833
147A	0.739	0.734	0.728	0.722	0.7	0.68	0.636	0.647	0.631	0.666	0.634
147B	0.743	0.737	0.737	0.727	0.714	0.692	0.661	0.68	0.672	0.698	0.645
C147	0.76	0.754	0.752	0.743	0.736	0.709	0.653	0.63	0.637	0.639	0.63
148A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.155	2.772
148B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.123	2.867
C148	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.172	2.768
149A	0.349	0.343	0.34	0.34	0.335	0.329	0.327	0.328	0.33	0.319	0.276
149B	0.349	0.343	0.34	0.337	0.332	0.324	0.318	0.314	0.311	0.291	0.231
C149	0.359	0.357	0.356	0.353	0.354	0.349	0.351	0.348	0.347	0.347	0.352
150A	3.216	3.166	3.152	3.129	3.07	2.193	2.004	1.872	1.561	1.208	0.993
150B	3.194	3.138	3.151	3.098	3.148	2.53	2.149	1.896	1.541	1.127	0.897
C150	3.35	3.353	3.373	3.33	3.417	3.383	3.385	3.398	3.304	3.286	2.659
151A	0.373	0.366	0.362	0.358	0.346	0.326	0.3	0.283	0.277	0.296	0.275
151B	0.374	0.366	0.362	0.359	0.347	0.326	0.3	0.289	0.288	0.331	0.298
C151	0.38	0.374	0.37	0.365	0.35	0.327	0.299	0.275	0.249	0.261	0.251
152A	3.234	3.167	3.137	3.092	2.692	2.099	1.989	1.724	1.451	1.102	0.851
152B	3.24	3.182	3.158	3.138	3.075	3.061	2.977	2.495	1.206	0.89	0.698
C152	3.359	3.334	3.334	3.313	3.255	3.266	3.226	3.181	3.09	2.618	1.997
153A	0.684	0.678	0.678	0.672	0.663	0.656	0.657	0.654	0.659	0.677	0.126
153B	0.693	0.687	0.691	0.682	0.676	0.669	0.668	0.668	0.677	0.716	0.644
C153	0.698	0.693	0.696	0.69	0.692	0.689	0.688	0.691	0.69	0.69	0.7

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
154A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
154B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C 154	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
155A	0.701	0.697	0.693	0.681	0.648	0.626	0.609	0.586	0.584	0.631	0.67
155B	0.711	0.708	0.704	0.69	0.675	0.645	0.616	0.601	0.604	0.641	0.731
C 155	0.719	0.709	0.708	0.709	0.689	0.688	0.649	0.603	0.591	0.624	0.687
156A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
156B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C 156	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
157A	0.361	0.35	0.348	0.34	0.332	0.329	0.322	0.324	0.312	0.144	0.067
157B	0.357	0.348	0.347	0.338	0.33	0.325	0.328	0.328	0.319	0.258	0.182
C 157	0.365	0.363	0.362	0.363	0.363	0.362	0.36	0.36	0.356	0.35	0.347
158A	3.277	3.367	OVER	3.416	1.927	1.462	1.023	0.733	0.348	0.145	0.217
158B	3.286	3.36	OVER	3.385	1.981	1.389	1.026	0.75	0.346	0.176	0.203
C 158	3.325	3.368	OVER	3.476	OVER	OVER	3.432	3.483	3.3	3.226	3.134
159A	0.379	0.368	0.365	0.356	0.346	0.335	0.324	0.319	0.313	0.269	0.246
159B	0.376	0.37	0.365	0.36	0.348	0.339	0.328	0.322	0.311	0.245	0.205
C 159	0.38	0.378	0.377	0.372	0.368	0.36	0.335	0.318	0.285	0.276	0.229
160A	3.303	3.442	OVER	OVER	2.539	1.747	1.394	1.104	0.4	0.291	0.25
160B	3.247	3.307	OVER	OVER	2.216	1.627	1.05	0.919	0.41	0.219	0.23
C 160	3.488	3.492	OVER	OVER	OVER	OVER	3.456	3.491	3.263	2.987	2.845
161A	0.346	0.337	0.337	0.329	0.319	0.308	0.303	0.301	0.269	0.229	0.211
161B	0.347	0.335	0.336	0.329	0.317	0.308	0.303	0.3	0.273	0.225	0.211
C 161	0.358	0.356	0.355	0.352	0.351	0.352	0.353	0.351	0.348	0.349	0.35
162A	3.176	3.174	3.244	3.303	3.391	3.449	3.462	3.431	1.37	0.63	0.468
162B	3.196	3.27	3.409	OVER	OVER	OVER	OVER	OVER	3.201	1.372	1.123
C 162	3.351	3.329	3.447	3.435	3.449	3.407	3.352	3.404	3.197	2.744	2.576
163A	0.355	0.345	0.347	0.337	0.325	0.311	0.286	0.302	0.284	0.251	0.234
163B	0.357	0.347	0.349	0.338	0.326	0.31	0.291	0.282	0.271	0.209	0.163
C 163	0.381	0.372	0.369	0.365	0.361	0.344	0.323	0.302	0.271	0.255	0.301
164A	3.2	3.199	3.296	3.366	3.422	3.468	3.319	3.357	3.019	1.43	1.168
164B	3.206	3.228	3.242	3.272	3.374	3.405	3.407	3.484	2.081	1.013	0.833
C 164	3.376	3.356	3.461	3.49	3.429	3.388	3.272	3.357	3.13	2.547	2.453
165A	0.369	0.368	0.368	0.364	0.363	0.364	0.362	0.356	0.308	0.243	0.232
165B	0.368	0.367	0.364	0.363	0.361	0.362	0.36	0.359	0.31	0.237	0.225
C 165	0.376	0.375	0.376	0.376	0.378	0.376	0.37	0.368	0.365	0.361	0.355
166A	3.421	3.452	3.346	3.203	3.026	2.84	2.213	2.03	1.853	1.787	1.78
166B	3.439	3.472	3.374	3.223	3.046	2.865	2.23	2.068	1.859	1.807	1.799
C 166	3.298	3.294	3.309	3.303	3.312	3.327	3.374	3.363	3.279	3.303	3.261
167A	0.382	0.378	0.376	0.372	0.368	0.366	0.348	0.327	0.253	0.196	0.182
167B	0.385	0.38	0.378	0.374	0.37	0.367	0.337	0.312	0.238	0.185	0.168
C 167	0.392	0.389	0.386	0.382	0.378	0.371	0.35	0.335	0.333	0.302	0.305
168A	3.458	3.47	3.342	3.168	2.96	2.638	2.026	1.832	1.675	1.583	1.559
168B	3.477	3.453	3.346	3.167	2.945	2.581	1.997	1.771	1.627	1.531	1.52
C 168	3.294	3.315	3.298	3.306	3.31	3.315	3.341	3.315	3.249	3.257	3.233
169A	0.338	0.333	0.331	0.328	0.323	0.32	0.311	0.303	0.125	0.055	0.033
169B	0.338	0.335	0.332	0.328	0.324	0.319	0.312	0.294	0.113	0.06	0.033
C 169	0.336	0.33	0.327	0.323	0.318	0.314	0.306	0.292	0.107	0.047	0.027
170A	3.168	3.157	3.157	3.175	3.206	3.297	3.384	3.313	0.996	0.4	0.251
170B	3.181	3.155	3.161	3.194	3.257	3.338	3.393	3.307	0.859	0.412	0.279
C 170	3.263	3.262	3.271	3.272	3.258	3.259	3.144	3.082	2.818	2.531	2.322
171A	0.36	0.356	0.353	0.347	0.331	0.297	0.222	0.199	0.129	0.058	0.037
171B	0.368	0.364	0.36	0.353	0.336	0.297	0.223	0.195	0.141	0.064	0.059
C 171	0.379	0.375	0.369	0.363	0.351	0.318	0.233	0.195	0.132	0.076	0.07
172A	3.256	3.276	3.275	3.322	3.365	3.199	2.306	1.806	1.45	2.021	1.385
172B	3.232	3.256	3.272	3.293	3.341	3.113	2.237	1.786	1.835	0.965	0.937
C 172	3.248	3.257	3.258	3.234	3.202	3.124	2.894	2.681	1.904	1.417	1.296
173A	0.379	0.375	0.374	0.371	0.367	0.365	0.357	0.358	0.353	0.357	0.352
173B	0.366	0.363	0.361	0.358	0.353	0.348	0.343	0.339	0.337	0.336	0.336
C 173	0.37	0.366	0.365	0.364	0.361	0.359	0.356	0.354	0.351	0.347	0.342
174A	3.218	3.22	3.252	3.308	3.387	3.379	OVER	3.48	1.464	0.604	0.399
174B	3.242	3.257	3.307	3.372	3.442	3.426	2.391	1.529	0.954	0.579	0.204
C 174	3.253	3.259	3.288	3.306	3.319	3.32	3.311	3.331	3.269	3.262	3.223
175A	0.398	0.388	0.388	0.384	0.374	0.361	0.34	0.337	0.335	0.308	0.19
175B	0.404	0.402	0.398	0.393	0.384	0.373	0.362	0.35	0.335	0.325	0.344
C 175	0.422	0.42	0.405	0.404	0.394	0.395	0.375	0.363	0.347	0.329	0.339
176A	3.275	3.342	3.434	OVER	OVER	OVER	3.473	2.178	1.204	0.76	0.337
176B	3.262	3.334	OVER	OVER	OVER	OVER	1.746	1.224	0.585	0.524	0.382
C 176	3.287	3.305	3.312	3.331	3.343	3.342	3.323	3.333	3.262	3.243	3.216
177A	0.734	0.729	0.725	0.72	0.713	0.709	0.702	0.702	0.7	0.7	0.694
177B	0.736	0.726	0.722	0.717	0.709	0.699	0.69	0.688	0.682	0.677	0.67
C 177	0.743	0.741	0.734	0.731	0.727	0.725	0.72	0.715	0.716	0.707	0.695
178A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.49
178B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.316
C 178	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
179A	0.767	0.761	0.756	0.749	0.731	0.715	0.696	0.686	0.672	0.675	0.657
179B	0.771	0.763	0.76	0.751	0.739	0.723	0.708	0.697	0.679	0.664	0.648
C 179	0.777	0.771	0.769	0.763	0.755	0.743	0.724	0.706	0.678	0.648	0.658
180A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
180B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C 180	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
181A	0.356	0.352	0.35	0.347	0.343	0.336	0.337	0.33	0.312	0.153	0.12
181B	0.356	0.353	0.35	0.348	0.344	0.336	0.338	0.337	0.325	0.198	0.155
C 181	0.36	0.361	0.359	0.357	0.355	0.353	0.35	0.348	0.344	0.34	0.339
182A	3.166	3.202	3.293	3.323	3.287	2.546	2.196	2.236	OVER	0.062	0.044
182B	3.217	3.289	3.38	3.4	3.369	2.507	2.242	2.071	1.839	0.53	0.182
C 182	3.227	3.257	3.257	3.272	3.279	3.285	3.271	3.273	3.182	3.178	3.185

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
183A	0.385	0.381	0.378	0.373	0.366	0.359	0.352	0.36	0.199	0.108	0.085
183B	0.397	0.39	0.386	0.382	0.374	0.362	0.351	0.351	0.391	0.359	0.334
C183	0.39	0.388	0.386	0.383	0.379	0.369	0.355	0.344	0.327	0.313	0.307
184A	3.434	OVER	OVER	OVER	OVER	2.975	1.21	0.925	0.612	0.383	0.285
184B	3.301	OVER	OVER	OVER	OVER	2.38	0.919	0.987	0.682	0.555	0.311
C184	3.297	3.315	3.326	3.335	3.313	3.321	3.303	3.267	3.189	3.166	3.154
185A	0.364	0.361	0.358	0.353	0.342	0.326	0.309	0.306	0.317	0.317	0.316
185B	0.36	0.355	0.352	0.346	0.337	0.321	0.304	0.302	0.314	0.316	0.315
C185	0.364	0.363	0.363	0.362	0.361	0.36	0.359	0.359	0.36	0.361	0.362
186A	2.889	2.795	2.718	2.619	2.509	2.438	2.389	2.368	2.324	2.338	2.296
186B	2.882	2.767	2.699	2.585	2.48	2.414	2.366	2.348	2.303	2.314	2.265
C186	2.986	3.01	3.06	3.146	3.175	3.241	3.269	3.261	3.034	3.209	2.981
187A	0.412	0.404	0.4	0.392	0.379	0.355	0.323	0.315	0.302	0.308	0.301
187B	0.407	0.402	0.398	0.391	0.378	0.353	0.322	0.315	0.303	0.307	0.299
C187	0.408	0.405	0.404	0.4	0.396	0.388	0.378	0.37	0.361	0.365	0.363
188A	2.912	2.801	2.728	2.622	2.502	2.41	2.309	2.263	2.198	2.214	2.175
188B	2.9	2.804	2.734	2.61	2.499	2.412	2.314	2.268	2.199	2.205	2.169
C188	3.026	3.06	3.102	3.176	3.21	3.278	3.319	3.279	3.039	3.212	3.001
189A	0.719	0.711	0.708	0.699	0.684	0.665	0.658	0.661	0.661	0.658	0.657
189B	0.722	0.712	0.709	0.698	0.68	0.659	0.65	0.651	0.649	0.647	0.644
C189	0.726	0.721	0.72	0.719	0.719	0.719	0.716	0.716	0.716	0.717	0.718
190A	3.201	3.256	3.313	3.484	OVER	OVER	OVER	OVER	3.284	OVER	3.204
190B	3.216	3.271	3.335	3.488	OVER	OVER	OVER	OVER	3.216	OVER	3.234
C190	3.233	3.284	3.35	OVER	OVER	OVER	OVER	OVER	3.316	OVER	3.203
191A	0.766	0.754	0.747	0.735	0.712	0.683	0.667	0.66	0.64	0.643	0.634
191B	0.772	0.76	0.755	0.742	0.72	0.684	0.66	0.648	0.624	0.633	0.622
C191	0.782	0.778	0.776	0.774	0.768	0.761	0.741	0.727	0.709	0.722	0.713
192A	3.213	3.314	3.382	OVER	OVER	OVER	OVER	OVER	3.355	OVER	3.243
192B	3.272	3.296	3.403	OVER	OVER	OVER	OVER	OVER	3.374	OVER	3.257
C192	3.271	3.329	3.357	OVER	OVER	OVER	OVER	OVER	3.352	OVER	3.275
193A	0.376	0.369	0.367	0.36	0.346	0.33	0.316	0.309	0.298	0.291	0.286
193B	0.374	0.372	0.37	0.362	0.346	0.331	0.316	0.308	0.3	0.288	0.281
C193	0.374	0.373	0.373	0.372	0.372	0.371	0.37	0.37	0.368	0.365	0.364
194A	3.028	2.922	3.068	3.195	3.243	3.173	2.447	2.283	2.097	2.011	2.036
194B	3.028	2.963	3.055	3.175	3.206	3.142	2.437	2.244	2.071	2.007	2.02
C194	3.143	3.169	3.221	3.314	3.387	3.404	3.408	3.375	3.009	2.943	3.216
195A	0.394	0.388	0.381	0.369	0.352	0.332	0.309	0.297	0.266	0.266	0.258
195B	0.389	0.383	0.376	0.367	0.352	0.332	0.31	0.298	0.272	0.268	0.262
C195	0.393	0.388	0.388	0.385	0.38	0.374	0.367	0.361	0.347	0.351	0.346
196A	3.02	2.968	3.062	3.126	3.15	2.873	2.291	2.046	1.877	1.79	1.783
196B	3.05	2.994	3.098	3.162	3.213	2.992	2.371	2.147	1.892	1.801	1.777
C196	3.144	3.132	3.222	3.305	3.375	3.373	3.36	3.361	2.976	2.935	3.174
197A	0.727	0.717	0.71	0.7	0.685	0.67	0.661	0.654	0.648	0.643	0.641
197B	0.729	0.721	0.71	0.702	0.687	0.674	0.664	0.656	0.649	0.645	0.644
C197	0.74	0.741	0.74	0.739	0.737	0.736	0.739	0.737	0.735	0.73	0.732
198A	3.36	3.406	OVER	OVER	OVER	OVER	OVER	OVER	3.159	3.109	OVER
198B	3.386	3.46	OVER	OVER	OVER	OVER	OVER	OVER	3.16	3.104	OVER
C198	3.361	3.363	3.4	OVER	OVER	OVER	OVER	OVER	3.175	3.144	OVER
199A	0.76	0.751	0.74	0.725	0.707	0.685	0.666	0.649	0.617	0.62	0.609
199B	0.754	0.742	0.733	0.718	0.697	0.673	0.653	0.632	0.6	0.608	0.596
C199	0.764	0.759	0.755	0.754	0.75	0.745	0.736	0.734	0.716	0.708	0.7
200A	3.396	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.149	3.095	3.446
200B	3.339	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.219	3.108	OVER
C200	3.381	3.462	OVER	OVER	OVER	OVER	OVER	OVER	3.159	3.132	OVER
201A	0.361	0.357	0.351	0.34	0.319	0.29	0.265	0.261	0.254	0.248	0.25
201B	0.366	0.357	0.352	0.34	0.318	0.286	0.261	0.258	0.249	0.245	0.242
C201	0.365	0.364	0.362	0.363	0.362	0.362	0.362	0.362	0.362	0.363	0.362
202A	2.893	2.583	2.347	2.089	1.874	1.71	1.599	1.536	1.469	1.437	1.421
202B	2.903	2.571	2.325	2.07	1.874	1.691	1.586	1.536	1.461	1.423	1.409
C202	3.141	3.159	3.167	3.28	3.339	3.392	3.407	3.395	3.077	3.041	3.144
203A	0.389	0.381	0.375	0.36	0.336	0.299	0.268	0.263	0.241	0.233	0.225
203B	0.396	0.389	0.381	0.367	0.341	0.302	0.267	0.263	0.235	0.23	0.22
C203	0.397	0.397	0.396	0.392	0.387	0.381	0.372	0.371	0.349	0.354	0.352
204A	2.873	2.563	2.322	2.062	1.843	1.675	1.526	1.458	1.333	1.302	1.314
204B	2.887	2.568	2.328	2.06	1.839	1.675	1.538	1.463	1.349	1.324	1.337
C204	3.145	3.128	3.205	3.31	3.374	3.415	3.413	3.393	3.087	3.036	3.133
205A	0.354	0.348	0.341	0.326	0.307	0.287	0.272	0.265	0.258	0.267	0.272
205B	0.357	0.351	0.343	0.329	0.31	0.292	0.275	0.267	0.259	0.261	0.28
C205	0.367	0.368	0.365	0.362	0.364	0.364	0.367	0.363	0.363	0.363	0.36
206A	2.884	2.842	2.93	2.997	2.991	1.612	1.146	0.994	0.762	0.703	0.672
206B	2.884	2.844	2.914	3.109	2.991	1.613	1.14	0.981	0.757	0.674	0.66
C206	3.131	3.162	3.198	3.258	3.333	3.366	3.38	3.368	3.067	3.043	3.11
207A	0.383	0.374	0.364	0.349	0.328	0.304	0.277	0.272	0.248	0.247	0.166
207B	0.381	0.37	0.361	0.346	0.322	0.301	0.273	0.265	0.244	0.252	0.176
C207	0.391	0.39	0.389	0.383	0.379	0.376	0.367	0.363	0.355	0.346	0.338
208A	2.903	2.905	2.963	3.008	2.872	1.494	1	0.792	0.493	0.37	0.316
208B	2.923	2.922	2.969	3.026	2.931	1.594	1.076	0.845	0.525	0.429	0.416
C208	3.157	3.175	3.194	3.307	3.357	3.401	3.408	3.37	3.084	3.059	3.154
209A	0.344	0.335	0.33	0.322	0.311	0.295	0.278	0.269	0.253	0.23	0.217
209B	0.346	0.336	0.331	0.323	0.312	0.297	0.279	0.269	0.254	0.229	0.216
C209	0.343	0.337	0.335	0.331	0.326	0.318	0.307	0.3	0.283	0.258	0.238
210A	2.991	2.83	2.707	2.513	2.195	1.878	1.753	1.73	1.663	1.586	1.538
210B	2.979	2.817	2.682	2.488	2.168	1.857	1.752	1.685	1.635	1.564	1.519
C210	3.099	3.176	3.166	3.227	3.287	3.298	3.249	3.205	2.894	2.664	2.414
211A	0.374	0.362	0.357	0.348	0.335	0.314	0.291	0.276	0.251	0.223	0.209
211B	0.379	0.369	0.363	0.353	0.34	0.319	0.293	0.279	0.253	0.229	0.209
C211	0.382	0.374	0.367	0.361	0.352	0.338	0.312	0.292	0.253	0.245	0.224
212A	3.008	2.86	2.74	2.549	2.231	1.941	1.806	1.773	1.684	1.559	1.507
212B	3.002	2.862	2.73	2.536	2.209	1.908	1.782	1.746	1.667	1.561	1.496
C212	3.162	3.205	3.211	3.307	3.34	3.351	3.306	3.243	2.923	2.677	2.439
213A	0.704	0.689	0.684	0.671	0.652	0.622	0.586	0.554	0.501	0.454	0.43
213B	0.698	0.684	0.679	0.666	0.645	0.617	0.578	0.544	0.491	0.448	0.426
C213	0.712	0.704	0.702	0.696	0.688	0.677	0.662	0.645	0.615	0.552	0.496
214A	3.387	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.133	3.176	3.228
214B	3.436	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.189	3.141	3.247
C214	3.438	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.389	3.373	OVER
215A	0.723	0.71	0.702	0.681	0.66	0.622	0.571	0.543	0.469	0.433	0.4
215B	0.735	0.72	0.709	0.697	0.673	0.642	0.594	0.557	0.501	0.447	0.411
C215	0.725	0.714	0.712	0.705	0.694	0.675	0.648	0.626	0.592	0.524	0.464
216A	3.462	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.281	3.241	3.252
216B	3.419	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.26	3.249	3.278
C216	3.424	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.45	3.489	OVER
217A	0.365	0.362	0.358	0.354	0.345	0.332	0.318	0.308	0.3	0.29	0.28
217B	0.361	0.3557	0.354	0.35	0.342	0.328	0.314	0.304	0.294	0.284	0.271
C217	0.363	0.36	0.359	0.358	0.357	0.355	0.353	0.35	0.348	0.341	0.337
218A	3.035	2.985	2.975	3.005	2.979	2.898	2.826	2.684	2.481	2.364	2.3
218B	3.041	2.995	2.985	3.013	2.987	2.899	2.83	2.685	2.483	2.369	2.3
C218	3.113	3.158	3.131	3.271	3.352	3.385	3.388	3.368	3.105	3.045	3.179
219A	0.386	0.383	0.38	0.373	0.363	0.348	0.329	0.322	0.291	0.28	0.259
219B	0.386	0.383	0.379	0.373	0.363	0.349	0.33	0.315	0.292	0.278	0.258
C219	0.38	0.378	0.377	0.375	0.372	0.366	0.357	0.347	0.341	0.329	0.321
220A	3.072	3.034	3.034	3.051	2.989	2.849	2.696	2.556	2.394	2.239	2.065
220B	3.112	3.109	3.032	3.085	3.011	2.863	2.708	2.557	2.393	2.243	2.137
C220	3.133	3.141	3.185	3.292	3.366	3.404	3.411	3.388	3.142	3.026	3.175
221A	0.719	0.711	0.706	0.699	0.689	0.673	0.658	0.647	0.641	0.633	0.643
221B	0.719	0.714	0.71	0.703	0.684	0.667	0.655	0.644	0.638	0.634	0.634
C221	0.725	0.722	0.72	0.72	0.72	0.718	0.715	0.709	0.706	0.697	0.692
222A	3.412	3.47	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.781
222B	3.438	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.669
C222	3.432	3.409	3.463	OVER	OVER	OVER	OVER	OVER	OVER	3.307	OVER
223A	0.751	0.742	0.735	0.728	0.714	0.698	0.676	0.666	0.646	0.622	0.617
223B	0.748	0.744	0.74	0.73	0.713	0.694	0.675	0.665	0.639	0.625	0.612
C223	0.746	0.743	0.741	0.74	0.736	0.731	0.719	0.707	0.703	0.687	0.674
224A	3.457	3.491	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.828
224B	3.414	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.88
C224	3.392	3.376	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.296	OVER
225A	0.345	0.335	0.329	0.318	0.31	0.293	0.28	0.273	0.251	0.226	0.212
225B	0.35	0.338	0.332	0.322	0.31	0.296	0.279	0.269	0.248	0.225	0.212
C225	0.354	0.348	0.347	0.343	0.338	0.331	0.321	0.313	0.299	0.28	0.265
226A	2.913	2.608	2.432	2.161	1.893	1.768	1.624	1.618	1.511	1.408	1.346
226B	2.906	2.592	2.422	2.151	1.866	1.749	1.659	1.607	1.502	1.397	1.334
C226	3.145	3.175	3.204	3.319	3.062	3.385	3.364	3.312	3.075	2.789	2.512
227A	0.378	0.368	0.362	0.348	0.34	0.319	0.308	0.295	0.269	0.231	0.218
227B	0.388	0.374	0.368	0.356	0.339	0.317	0.296	0.284	0.261	0.236	0.216
C227	0.373	0.368	0.366	0.359	0.362	0.344	0.325	0.314	0.288	0.28	0.263
228A	2.921	2.604	2.434	2.16	1.917	1.789	1.69	1.632	1.533	1.439	1.365
228B	2.919	2.604	2.427	2.154	1.891	1.78	1.685	1.63	1.53	1.437	1.381
C228	3.168	3.201	3.214	3.319	3.071	3.404	3.378	3.3	3.032	2.781	2.526
229A	0.364	0.357	0.354	0.346	0.336	0.315	0.306	0.304	0.295	0.26	0.246
229B	0.367	0.362	0.359	0.35	0.337	0.319	0.306	0.304	0.29	0.264	0.25
C229	0.368	0.366	0.367	0.365	0.365	0.363	0.359	0.358	0.355	0.347	0.339
230A	2.963	2.942	2.933	2.972	2.823	2.999	2.779	2.622	2.415	2.246	2.125
230B	2.964	2.936	2.922	2.958	2.879	3.015	2.785	2.639	2.407	2.24	2.116
C230	3.124	3.154	3.193	3.283	3.04	3.398	3.445	3.412	3.215	3.192	3.073
231A	0.376	0.37	0.366	0.357	0.343	0.322	0.306	0.297	0.283	0.252	0.23
231B	0.386	0.38	0.376	0.366	0.35	0.332	0.314	0.3	0.28	0.241	0.22
C231	0.396	0.395	0.394	0.391	0.391	0.384	0.374	0.365	0.342	0.333	0.319
232A	3	2.966	2.966	2.944	2.71	2.859	2.631	2.519	2.332	2.18	2.074
232B	3.004	2.983	2.971	2.947	2.749	2.872	2.644	2.533	2.358	2.219	2.107
C232	3.107	3.183	3.215	3.299	3.036	3.417	3.453	3.413	3.219	3.193	3.085
233A	0.373	0.373	0.371	0.369	0.365	0.361	0.359	0.357	0.355	0.354	0.353
233B	0.371	0.37	0.368	0.367	0.365	0.361	0.359	0.357	0.355	0.355	0.354
C233	0.375	0.376	0.376	0.376	0.375	0.373	0.373	0.394	0.389	0.395	0.392
234A	2.989	3.097	3.205	3.448	OVER	OVER	OVER	2.504	2.164	2.038	1.976
234B	2.999	3.081	3.169	3.395	OVER	OVER	OVER	2.541	2.223	2.098	1.979
C234	3.02	3.133	3.185	3.372	3.437	OVER	3.499	OVER	3.066	3.157	3.316
235A	0.393	0.388	0.386	0.383	0.379	0.37	0.36	0.355	0.341	0.36	0.34
235B	0.396	0.393	0.393	0.389	0.385	0.375	0.367	0.365	0.35	0.35	0.345
C235	0.395	0.395	0.393	0.391	0.388	0.383	0.379	0.374	0.362	0.363	0.356
236A	3.005	3.081	3.189	3.399	OVER	OVER	OVER	2.411	2.369	1.961	1.885
236B	3.01	3.067	3.192	3.364	OVER	OVER	OVER	2.427	2.115	1.986	1.923
C236	3.004	3.129	3.191	3.34	3.407	3.459	3.457	3.449	3.042	3.125	3.284
237A	0.726	0.728	0.725	0.725	0.716	0.713	0.714	0.709	0.707	0.71	0.71
237B	0.737	0.735	0.731	0.726	0.724	0.721	0.717	0.717	0.715	0.716	0.715
C237	0.733	0.732	0.731	0.734	0.732	0.732	0.731	0.73	0.728	0.728	0.725
238A	3.218	3.479	OVER	OVER	OVER	OVER	OVER	OVER	3.246	3.424	OVER
238B	3.236	3.452	OVER	OVER	OVER	OVER	OVER	OVER	3.24	3.434	OVER
C238	3.283	3.384	OVER	OVER	OVER	OVER	OVER	OVER	3.313	3.459	OVER
239A	0.761	0.759	0.757	0.751	0.743	0.73	0.717	0.703	0.691	0.701	0.692
239B	0.766	0.756	0.751	0.745	0.738	0.73	0.715	0.711	0.691	0.693	0.687
C239	0.769	0.767	0.765	0.763	0.761	0.755	0.745	0.739	0.716	0.721	0.709
240A	3.224	3.4	OVER	OVER	OVER	OVER	OVER	OVER	3.253	3.422	OVER
240B	3.237	3.404	OVER	OVER	OVER	OVER	OVER	OVER	3.264	3.466	OVER
C240	3.216	3.363	OVER	OVER	OVER	OVER	OVER	OVER	3.262	3.481	OVER

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
241A	0.358	0.355	0.353	0.35	0.348	0.346	0.341	0.338	0.337	0.335	0.335
241B	0.358	0.354	0.354	0.353	0.349	0.343	0.338	0.336	0.334	0.334	0.333
C241	0.355	0.355	0.354	0.353	0.352	0.351	0.35	0.351	0.351	0.348	0.345
242A	3.333	3.319	3.34	3.374	3.381	3.387	2.441	2.203	2.037	1.794	1.642
242B	3.323	3.313	3.325	3.365	3.386	3.38	2.441	2.228	1.961	1.807	1.616
C242	3.428	3.425	3.422	3.446	3.437	3.444	3.423	3.423	3.264	3.396	3.424
243A	0.368	0.364	0.364	0.36	0.354	0.348	0.341	0.337	0.324	0.324	0.319
243B	0.369	0.366	0.365	0.36	0.356	0.348	0.339	0.335	0.322	0.318	0.312
C243	0.37	0.369	0.367	0.364	0.364	0.358	0.353	0.351	0.339	0.336	0.33
244A	3.355	3.338	3.352	3.381	3.408	3.395	2.411	2.17	1.894	1.733	1.609
244B	3.367	3.335	3.356	3.395	3.38	3.334	2.454	2.174	1.904	1.727	1.582
C244	3.395	3.385	3.407	3.398	3.414	3.384	3.368	3.364	3.241	3.302	3.329
245A	0.698	0.696	0.694	0.688	0.684	0.681	0.681	0.681	0.678	0.677	0.619
245B	0.698	0.698	0.696	0.689	0.687	0.684	0.679	0.678	0.68	0.679	0.676
C245	0.702	0.702	0.701	0.703	0.7	0.701	0.699	0.696	0.698	0.696	0.694
246A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
246B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C246	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
247A	0.723	0.718	0.714	0.711	0.704	0.696	0.686	0.68	0.667	0.662	0.652
247B	0.718	0.712	0.706	0.703	0.694	0.688	0.68	0.672	0.66	0.658	0.648
C247	0.724	0.72	0.718	0.718	0.714	0.711	0.703	0.699	0.687	0.676	0.665
248A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
248B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C248	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
249A	0.363	0.36	0.358	0.355	0.35	0.345	0.346	0.353	0.362	0.369	0.373
249B	0.367	0.362	0.359	0.356	0.351	0.347	0.353	0.355	0.366	0.375	0.376
C249	0.367	0.368	0.368	0.368	0.369	0.366	0.363	0.365	0.363	0.365	0.364
250A	3.279	3.402	OVER	OVER	OVER	OVER	2.474	1.318	0.822	0.553	0.463
250B	3.287	3.438	OVER	OVER	OVER	OVER	2.134	1.312	0.97	0.549	0.49
C250	3.379	3.436	3.45	3.484	3.498	OVER	OVER	OVER	3.476	OVER	3.478
251A	0.389	0.386	0.384	0.383	0.371	0.365	0.36	0.363	0.358	0.365	0.36
251B	0.398	0.395	0.392	0.387	0.379	0.372	0.365	0.364	0.363	0.367	0.361
C251	0.396	0.395	0.395	0.393	0.39	0.383	0.371	0.365	0.353	0.357	0.343
252A	3.351	3.483	OVER	OVER	OVER	OVER	1.945	1.474	0.914	1.065	0.894
252B	3.314	3.436	OVER	OVER	OVER	OVER	2.027	1.388	1.02	0.764	0.678
C252	3.444	3.401	3.456	3.492	3.497	OVER	OVER	OVER	3.411	3.442	3.443
253A	0.355	0.352	0.349	0.347	0.34	0.334	0.332	0.333	0.338	0.342	0.342
253B	0.354	0.352	0.35	0.346	0.339	0.334	0.332	0.334	0.34	0.345	0.347
C253	0.366	0.361	0.362	0.362	0.361	0.359	0.356	0.356	0.356	0.353	0.35
254A	3.125	3.14	3.244	3.368	3.465	OVER	OVER	1.694	1.056	0.255	0.203
254B	3.214	3.244	3.331	3.449	OVER	OVER	OVER	1.483	0.733	0.248	0.219
C254	3.293	3.32	3.343	3.38	3.393	3.402	3.428	3.41	3.355	3.391	3.377
255A	0.378	0.373	0.371	0.368	0.359	0.349	0.332	0.329	0.338	0.34	0.332
255B	0.389	0.385	0.383	0.378	0.371	0.362	0.351	0.345	0.341	0.348	0.34
C255	0.389	0.388	0.386	0.386	0.38	0.375	0.368	0.36	0.357	0.346	0.332
256A	3.217	3.261	3.324	3.438	OVER	OVER	3.475	1.724	0.983	1.386	1.376
256B	3.224	3.241	3.329	3.463	OVER	OVER	3.465	1.674	0.789	1.057	0.663
C256	3.284	3.321	3.347	3.364	3.36	3.384	3.356	3.345	3.321	3.338	3.308
257A	0.363	0.361	0.358	0.358	0.364	0.37	0.373	0.368	0.359	0.279	0.253
257B	0.364	0.36	0.357	0.357	0.364	0.371	0.371	0.367	0.357	0.276	0.246
C257	0.364	0.363	0.363	0.363	0.362	0.362	0.362	0.363	0.363	0.358	0.35
258A	3.443	OVER	3.482	3.384	3.292	3.178	2.854	2.621	2.453	2.415	2.402
258B	3.452	3.491	3.451	3.415	3.309	3.205	2.897	2.637	2.491	2.449	2.429
C258	3.319	3.297	3.32	3.305	3.318	3.311	3.279	3.285	3.314	3.277	3.337
259A	0.366	0.359	0.355	0.359	0.362	0.363	0.343	0.311	0.202	0.166	0.145
259B	0.37	0.362	0.358	0.364	0.367	0.363	0.337	0.309	0.164	0.143	0.122
C259	0.37	0.367	0.363	0.361	0.356	0.349	0.346	0.333	0.271	0.274	0.258
260A	3.474	3.488	3.445	3.354	3.228	3.029	2.652	2.446	2.219	2.174	2.124
260B	3.434	3.399	3.344	3.27	3.179	3.3039	2.67	2.399	2.158	2.211	2.185
C260	3.295	3.28	3.277	3.283	3.284	3.282	3.23	3.241	3.229	3.177	3.211
261A	0.255	0.205	0.151	0.089	0.015	0.002	0.002	0.002	0.002	0.003	0.003
261B	0.248	0.193	0.14	0.08	0.014	0.003	0.003	0.003	0.002	0.005	0.005
C261	0.246	0.194	0.144	0.086	0.016	0.002	0.002	0.002	0.003	0.003	0.004
262A	3.324	3.383	3.437	3.367	1.754	1.297	0.378	0.247	0.105	0.034	0.014
262B	3.281	3.383	3.431	3.259	1.728	1.026	0.292	0.24	0.124	0.065	0.033
C262	3.268	3.267	3.298	3.289	2.869	1.748	0.731	0.561	0.215	0.125	0.074
263A	0.278	0.222	0.167	0.104	0.032	0.022	0.02	0.018	0.015	0.013	0.012
263B	0.278	0.22	0.167	0.104	0.037	0.021	0.024	0.022	0.019	0.013	0.013
C263	0.288	0.235	0.184	0.121	0.042	0.027	0.023	0.021	0.017	0.014	0.012
264A	3.314	3.382	3.443	3.371	2.456	1.074	2.847	2.625	1.657	1.266	1.663
264B	3.305	3.381	3.439	3.381	2.181	1.077	2.1	1.806	1.63	1.044	0.709
C264	3.281	3.288	3.302	3.322	3.303	2.283	1.081	0.7	0.546	0.354	0.248
265a	0.345	0.332	0.321	0.299	0.344	0.373	0.339	0.298	0.154	0.033	0.017
265b	0.341	0.328	0.313	0.288	0.292	0.365	0.306	0.258	0.137	0.055	0.02
c265	0.348	0.338	0.327	0.304	0.263	0.376	0.339	0.302	0.18	0.054	0.026
266a	3.282	3.474	OVER	OVER	OVER	3.025	1.631	0.941	0.247	0.077	0.045
266B	3.269	3.465	OVER	OVER	OVER	2.865	1.563	0.952	0.242	0.084	0.062
C266	3.194	3.234	3.263	3.301	3.348	3.408	3.499	3.261	1.861	0.379	0.159
267A	0.384	0.367	0.352	0.323	0.318	0.322	0.228	0.144	0.06	0.06	0.008
267B	0.369	0.352	0.336	0.307	0.317	0.333	0.209	0.147	0.077	0.037	0.029
C267	0.387	0.372	0.358	0.333	0.288	0.396	0.302	0.244	0.137	0.077	0.05
268A	3.356	OVER	OVER	OVER	3.27	2.462	1.254	0.611	0.244	0.196	0.072
268B	3.361	OVER	OVER	OVER	3.346	2.565	1.477	0.904	0.254	0.104	0.083
C268	3.209	3.249	3.268	3.31	3.321	3.264	3.049	2.715	1.358	0.38	0.148
269A	0.703	0.692	0.685	0.734	0.744	0.756	0.74	0.442	0.191	0.034	0.012
269B	0.703	0.692	0.685	0.737	0.747	0.755	0.739	0.451	0.137	0.034	0.01
C269	0.712	0.702	0.691	0.676	0.758	0.764	0.756	0.577	0.16	0.038	0.015

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
270A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.657	1.467	0.634
270B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.558	1.311	0.534
C270	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.39	2.745
271A	0.729	0.709	0.689	0.695	0.684	0.637	0.345	0.216	0.102	0.023	0.009
271B	0.725	0.705	0.687	0.696	0.685	0.65	0.362	0.23	0.103	0.025	0.008
C271	0.759	0.747	0.735	0.71	0.747	0.731	0.537	0.368	0.166	0.046	0.024
272A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.74	1.667	0.99
272B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.597	1.748	1.239
C272	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.403	3.053
273A	0.339	0.32	0.307	0.296	0.366	0.368	0.319	0.284	0.164	0.046	0.011
273B	0.338	0.317	0.302	0.287	0.369	0.366	0.307	0.273	0.155	0.05	0.017
C273	0.339	0.324	0.309	0.286	0.249	0.378	0.235	0.159	0.063	0.03	0.022
274A	3.392	OVER	OVER	OVER	3.33	1.787	0.631	0.235	0.082	0.043	0.026
274B	3.389	OVER	OVER	OVER	3.434	1.74	0.632	0.245	0.094	0.048	0.025
C274	3.262	3.293	3.305	3.323	3.347	3.382	3.479	3.346	2.259	0.714	0.207
275A	0.368	0.342	0.324	0.297	0.327	0.312	0.224	0.161	0.054	0.019	0.009
275B	0.367	0.339	0.321	0.294	0.327	0.316	0.234	0.171	0.074	0.025	0.011
C275	0.371	0.352	0.338	0.312	0.268	0.371	0.308	0.266	0.145	0.061	0.031
276A	OVER	OVER	3.47	3.183	2.761	1.829	0.555	0.253	0.101	0.05	0.038
276B	OVER	OVER	3.38	3.089	2.707	1.884	0.669	0.331	0.109	0.054	0.038
C276	3.267	3.307	3.305	3.317	3.325	3.329	3.247	3.014	1.67	0.389	0.154
277A	0.354	0.347	0.344	0.335	0.328	0.313	0.293		0.263	0.249	0.244
277B	0.349	0.343	0.339	0.33	0.322	0.307	0.289		0.259	0.246	0.242
C277	0.354	0.354	0.351	0.351	0.35	0.348	0.347		0.341	0.336	0.334
278A	2.873	2.699	2.609	2.624	2.875	3.267	2.8		1.887	1.808	1.811
278B	2.88	2.695	2.61	2.617	2.856	3.267	2.817		1.873	1.811	1.812
C278	3.015	3.047	3.1	3.132	3.23	3.257	3.263		3.223	2.942	3.078
279A	0.38	0.372	0.365	0.356	0.343	0.324	0.291		0.219	0.183	0.19
279B	0.377	0.368	0.365	0.354	0.34	0.319	0.272		0.195	0.152	0.149
C279	0.387	0.38	0.376	0.37	0.363	0.346	0.308		0.225	0.184	0.177
280A	2.886	2.709	2.624	2.643	2.8	3.001	2.742		1.8	1.638	1.636
280B	2.891	2.712	2.624	2.652	2.806	2.988	2.726		1.807	1.652	1.632
C280	3.069	3.071	3.114	3.157	3.217	3.239	3.194		3.11	2.884	2.997
281A	0.717	0.708	0.702	0.69	0.677	0.662	0.645		0.623	0.615	0.615
281B	0.716	0.707	0.699	0.687	0.675	0.657	0.639		0.615	0.609	0.609
C281	0.719	0.717	0.717	0.715	0.716	0.713	0.71		0.705	0.7	0.698
282A	3.302	3.31	OVER	OVER	OVER	OVER	OVER		OVER	3.152	3.372
282B	3.332	3.356	3.484	OVER	OVER	OVER	OVER		OVER	3.186	3.427
C282	3.341	3.47	3.412	3.458	OVER	OVER	OVER		OVER	3.204	3.43
283A	0.752	0.737	0.73	0.716	0.694	0.664	0.611		0.475	0.393	0.397
283B	0.74	0.729	0.72	0.705	0.683	0.657	0.612		0.484	0.488	0.488
C283	0.757	0.752	0.75	0.752	0.742	0.734	0.71		0.636	0.606	0.606
284A	3.338	3.38	3.464	OVER	OVER	OVER	OVER		OVER	3.215	3.399
284B	3.321	3.362	3.483	OVER	OVER	OVER	OVER		OVER	3.253	3.409
C284	3.335	3.352	3.455	OVER	OVER	OVER	OVER		OVER	3.223	3.425
285A	0.36	0.355	0.35	0.34	0.33	0.321	0.332	0.328	0.304	0.236	0.234
285B	0.361	0.356	0.351	0.343	0.333	0.324	0.334	0.332	0.304	0.232	0.222
C285	0.365	0.363	0.365	0.362	0.362	0.36	0.361	0.363	0.368	0.357	0.347
286A	2.923	2.968	3.006	3.09	3.066	2.873	2.212	2.067	1.932	1.895	1.887
286B	2.942	2.987	3.018	3.114	3.084	2.895	2.233	2.079	1.935	1.91	1.9
C286	2.998	2.989	3.031	3.202	3.315	3.397	3.4	3.417	2.894	3.124	3.277
287A	0.397	0.387	0.381	0.366	0.348	0.322	0.293	0.248	0.166	0.1	0.126
287B	0.398	0.388	0.378	0.363	0.347	0.329	0.292	0.245	0.148	0.081	0.113
C287	0.4	0.394	0.392	0.384	0.374	0.352	0.309	0.277	0.205	0.246	0.194
288A	2.925	2.968	2.975	3.029	2.958	2.525	1.954	1.745	1.531	1.454	1.468
288B	2.922	2.985	2.966	3.045	2.979	2.542	1.926	1.74	1.53	1.395	1.372
C288	3.029	3.019	3.034	3.196	3.293	3.329	3.318	3.318	2.886	3.021	3.182
289A	0.729	0.718	0.71	0.697	0.687	0.692	0.708	0.702	0.674	0.598	0.581
289B	0.73	0.721	0.713	0.699	0.688	0.694	0.71	0.705	0.673	0.599	0.585
C289	0.735	0.735	0.737	0.735	0.735	0.733	0.735	0.738	0.741	0.729	0.708
290A	3.158	3.235	3.293	OVER	OVER	OVER	OVER	OVER	3.011	3.323	OVER
290B	3.223	3.19	3.256	OVER	OVER	OVER	OVER	OVER	3.06	3.33	OVER
C290	3.167	3.16	3.237	OVER	OVER	OVER	OVER	OVER	3.021	3.393	OVER
291A	0.761	0.747	0.734	0.712	0.698	0.682	0.619	0.556	0.438	0.462	0.442
291B	0.739	0.727	0.715	0.697	0.685	0.678	0.639	0.594	0.495	0.505	0.476
C291	0.758	0.751	0.749	0.745	0.735	0.71	0.682	0.669	0.614	0.566	0.563
292A	3.191	3.288	3.46	OVER	OVER	OVER	OVER	OVER	3.041	3.337	OVER
292B	3.135	3.263	3.346	OVER	OVER	OVER	OVER	OVER	3.035	3.408	OVER
C292	3.152	3.19	3.253	3.473	OVER	OVER	OVER	OVER	3.059	3.414	OVER
293A	0.344	0.333	0.322	0.303	0.273	0.238	0.198	0.166	0.132	0.103	0.095
293B	0.347	0.335	0.324	0.305	0.274	0.237	0.198	0.164	0.128	0.098	0.089
C293	0.36	0.359	0.358	0.358	0.356	0.355	0.352	0.352	0.35	0.347	0.346
294A	2.78	2.42	2.326	2.365	2.45	2.488	2.154	1.017	0.615	0.569	0.56
294B	2.764	2.393	2.304	2.345	2.433	2.463	2.15	1.014	0.595	0.545	0.535
C294	3.077	3.12	3.169	3.29	3.386	3.421	3.396	3.396	3.032	3.085	3.174
295A	0.379	0.365	0.354	0.329	0.29	0.236	0.167	0.144	0.08	0.042	0.035
295B	0.371	0.357	0.343	0.32	0.284	0.237	0.178	0.151	0.091	0.054	0.049
C295	0.383	0.379	0.377	0.373	0.366	0.352	0.323	0.333	0.263	0.183	0.196
296A	2.804	2.418	2.316	2.279	2.236	2.114	1.688	0.966	0.523	0.348	0.292
296B	2.776	2.394	2.318	2.332	2.321	2.263	1.595	0.695	0.393	0.319	0.297
C296	3.081	3.132	3.179	3.297	3.369	3.401	3.32	3.303	2.935	3.051	3.11
297A	0.342	0.328	0.315	0.297	0.288	0.3	0.29	0.261	0.161	0.06	0.048
297B	0.344	0.33	0.318	0.298	0.291	0.303	0.295	0.26	0.167	0.07	0.061
C297	0.352	0.351	0.35	0.349	0.348	0.347	0.347	0.351	0.355	0.351	0.341
298A	2.94	2.924	2.828	2.653	2.321	1.419	0.909	0.709	0.565	0.501	0.494
298B	2.913	2.909	2.797	2.621	2.298	1.415	0.917	0.696	0.558	0.502	0.493
C298	3.092	3.113	3.208	3.26	3.368	3.391	3.377	3.353	3.048	3.088	3.177

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
299A	0.367	0.349	0.334	0.314	0.303	0.294	0.253	0.193	0.081	0.029	0.021
299B	0.368	0.348	0.332	0.31	0.301	0.287	0.249	0.186	0.091	0.033	0.021
C299	0.386	0.382	0.377	0.372	0.362	0.345	0.317	0.303	0.26	0.231	0.221
300A	2.986	2.919	2.824	2.599	2.136	1.252	0.772	0.509	0.323	0.228	0.195
300B	2.94	2.887	2.778	2.56	2.085	1.218	0.73	0.464	0.282	0.213	0.191
C300	3.092	3.127	3.189	3.287	3.365	3.371	3.34	3.329	2.958	3.071	3.128
301A	0.327	0.308	0.298	0.279	0.261	0.23	0.198	0.178	0.155	0.127	0.108
301B	0.328	0.311	0.301	0.282	0.264	0.236	0.201	0.179	0.156	0.126	0.11
C301	0.332	0.32	0.312	0.304	0.295	0.281	0.272	0.252	0.208	0.169	0.148
302A	2.972	2.762	2.588	2.299	1.975	1.51	1.408	1.341	1.226	1.098	1.021
302B	2.954	2.756	2.589	2.28	1.969	1.516	1.407	1.342	1.22	1.097	1.021
C302	3.227	3.47	3.235	3.333	3.355	3.163	2.641	2.007	1.628	1.513	1.452
303A	0.359	0.341	0.328	0.307	0.284	0.262	0.253	0.244	0.222	0.193	0.146
303B	0.361	0.341	0.329	0.305	0.284	0.264	0.25	0.24	0.218	0.179	0.103
C303	0.376	0.36	0.348	0.333	0.325	0.292	0.273	0.274	0.278	0.274	0.221
304A	3.004	2.761	2.598	2.283	1.988	1.552	1.436	1.375	1.259	1.142	1.067
304B	2.974	2.76	2.596	2.292	1.961	1.528	1.429	1.374	1.275	1.182	1.119
C304	3.243	3.241	3.25	3.325	3.318	3.085	2.653	2.101	1.646	1.549	1.494
305A	0.672	0.644	0.631	0.608	0.589	0.523	0.466	0.41	0.356	0.297	0.267
305B	0.673	0.648	0.632	0.606	0.592	0.521	0.466	0.414	0.36	0.299	0.269
C305	0.682	0.67	0.662	0.649	0.64	0.628	0.595	0.559	0.469	0.39	0.35
306A	OVER	OVER	OVER	OVER	OVER	3.46	3.131	3.049	2.844	2.71	2.648
306B	OVER	OVER	OVER	OVER	OVER	OVER	3.153	3.035	2.843	2.715	2.646
C306	3.414	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.229	3.143	3.075
307A	0.717	0.691	0.672	0.645	0.64	0.563	0.541	0.557	0.525	0.442	0.403
307B	0.708	0.68	0.657	0.638	0.619	0.58	0.536	0.532	0.485	0.412	0.373
C307	0.721	0.703	0.692	0.668	0.655	0.607	0.555	0.541	0.607	0.562	0.507
308A	OVER	OVER	OVER	OVER	OVER	3.454	3.122	3.051	2.85	2.731	2.664
308B	OVER	OVER	OVER	OVER	OVER	OVER	3.216	3.11	2.913	2.804	2.729
C308	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.458	3.24	3.159
309A	0.357	0.349	0.342	0.328	0.306	0.286	0.271	0.261	0.22	0.157	0.126
309B	0.352	0.345	0.337	0.322	0.3	0.279	0.265	0.254	0.211	0.151	0.118
C309	0.363	0.361	0.36	0.358	0.355	0.352	0.346	0.34	0.338	0.331	0.278
310A	2.678	2.637	2.589	2.706	2.664	2.552	2.196	1.286	0.934	0.63	0.447
310B	2.662	2.628	2.592	2.701	2.666	2.532	0.702	0.392	0.218	0.157	0.081
C310	2.7	2.711	2.732	3.081	3.308	3.4	3.338	3.225	2.49	2.142	1.98
311A	0.364	0.353	0.345	0.328	0.299	0.279	0.253	0.271	0.237	0.171	0.134
311B	0.365	0.355	0.346	0.329	0.301	0.28	0.246	0.26	0.23	0.168	0.133
C311	0.374	0.377	0.365	0.362	0.352	0.332	0.285	0.277	0.225	0.243	0.189
312A	2.659	2.615	2.597	2.692	2.653	2.493	0.508	0.32	0.142	0.076	0.075
312B	2.719	2.665	2.644	2.709	2.683	2.55	0.655	0.285	0.13	0.1	0.049
C312	2.729	2.775	2.787	3.108	3.285	3.325	3.238	3.112	2.414	2.11	1.416
313A	0.708	0.702	0.688	0.663	0.639	0.628	0.612	0.612	0.552	0.423	0.352
313B	0.708	0.695	0.682	0.661	0.639	0.625	0.615	0.614	0.569	0.431	0.359
C313	0.715	0.717	0.714	0.713	0.709	0.707	0.699	0.694	0.688	0.716	0.693
314A	2.794	2.847	2.892	3.427	OVER	OVER	3.101	2.289	1.087	0.34	0.313
314B	2.752	2.818	2.824	3.433	OVER	OVER	3.091	2.223	1.067	0.298	0.19
C314	2.776	2.844	2.846	3.335	OVER	OVER	OVER	OVER	2.885	1.679	1.098
315A	0.709	0.697	0.682	0.653	0.628	0.594	0.558	0.559	0.538	0.412	0.337
315B	0.719	0.702	0.686	0.662	0.638	0.61	0.577	0.576	0.554	0.442	0.351
C315	0.734	0.731	0.729	0.722	0.712	0.696	0.664	0.666	0.587	0.666	0.554
316A	2.821	2.798	2.911	3.349	OVER	OVER	3.238	2.6	1.405	0.446	0.402
316B	2.835	2.819	2.818	3.328	OVER	OVER	3.234	2.461	1.267	0.417	0.299
C316	2.793	2.843	2.867	3.324	OVER	OVER	OVER	OVER	2.937	1.9	1.266
317A	0.318	0.294	0.274	0.25	0.217	0.182	0.145	0.134	0.116	0.092	0.077
317B	0.321	0.293	0.278	0.253	0.219	0.191	0.169	0.146	0.127	0.088	0.071
C317	0.334	0.32	0.311	0.302	0.291	0.275	0.25	0.222	0.185	0.146	0.123
318A	2.589	2.259	1.978	1.68	1.437	1.307	1.181	1.113	0.997	0.858	0.778
318B	2.597	2.251	1.971	1.672	1.432	1.306	1.182	1.112	0.994	0.857	0.772
C318	2.846	2.858	3.01	3.133	3.237	3.161	2.262	1.752	1.605	1.484	1.405
319A	0.335	0.308	0.287	0.264	0.228	0.206	0.169	0.173	0.136	0.117	0.094
319B	0.334	0.31	0.287	0.26	0.225	0.201	0.164	0.146	0.119	0.057	0.04
C319	0.342	0.327	0.323	0.304	0.288	0.286	0.243	0.215	0.221	0.168	0.138
320A	2.563	2.259	1.975	1.677	1.447	1.319	1.197	1.128	1.015	0.888	0.794
320B	2.587	2.246	1.986	1.692	1.459	1.328	1.201	1.135	1.027	0.907	0.834
C320	2.873	2.898	3.041	3.14	3.197	3.081	2.342	1.831	1.677	1.574	1.519
321A	0.35	0.337	0.321	0.299	0.27	0.253	0.226	0.193	0.167	0.13	0.104
321B	0.351	0.335	0.321	0.3	0.271	0.249	0.227	0.194	0.168	0.132	0.105
C321	0.363	0.362	0.36	0.358	0.356	0.352	0.346	0.339	0.338	0.329	0.286
322A	2.696	2.564	2.553	2.535	2.366	0.319	0.193	0.137	0.089	0.056	0.036
322B	2.708	2.58	2.568	2.504	2.356	0.195	0.12	0.109	0.044	0.033	0.027
C322	2.864	2.881	3.05	3.208	3.301	3.389	3.395	3.181	2.548	2.167	1.672
323A	0.368	0.35	0.332	0.308	0.273	0.253	0.228	0.207	0.192	0.124	0.118
323B	0.364	0.346	0.331	0.308	0.277	0.262	0.239	0.218	0.193	0.153	0.113
C323	0.384	0.381	0.376	0.371	0.364	0.348	0.299	0.284	0.255	0.282	0.243
324A	2.746	2.574	2.542	2.446	2.209	2.579	0.113	0.078	0.049	0.03	0.017
324B	2.739	2.637	2.584	2.519	2.234	0.581	0.188	0.092	0.065	0.103	0.02
C324	2.865	2.904	3.049	3.192	3.278	3.347	3.235	3.061	2.519	2.13	0.955
325A	0.362	0.355	0.351	0.35	0.346	0.344	0.342	0.345	0.349	0.353	0.306
325B	0.363	0.357	0.354	0.353	0.348	0.349	0.345	0.348	0.354	0.362	0.362
C325	0.369	0.367	0.364	0.363	0.361	0.361	0.359	0.358	0.355	0.35	0.349
326A	3.024	3.096	3.29	OVER	OVER	OVER	OVER	2.71	1.975	1.757	1.664
326B	3.031	3.08	3.268	OVER	OVER	OVER	OVER	2.483	1.935	1.751	1.635
C326	3.108	3.096	3.162	3.382	3.454	3.47	3.477	3.448	3.081	3.302	3.401
327A	0.377	0.37	0.366	0.363	0.347	0.343	0.321	0.338	0.325	0.354	0.349
327B	0.378	0.37	0.366	0.364	0.352	0.336	0.312	0.339	0.321	0.353	0.349
C327	0.383	0.378	0.374	0.37	0.362	0.347	0.319	0.347	0.296	0.311	0.302

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
328A	3.018	3.128	3.338	OVER	OVER	OVER	OVER	3.076	1.942	1.674	1.568
328B	3.021	3.126	3.31	OVER	OVER	OVER	OVER	OVER	1.974	1.66	1.57
C328	3.058	3.15	3.207	3.372	3.457	3.474	3.402	3.414	3.101	3.248	3.308
329A	0.716	0.711	0.711	0.709	0.706	0.706	0.71	0.713	0.718	0.723	0.683
329B	0.72	0.717	0.713	0.712	0.708	0.71	0.708	0.716	0.721	0.723	0.699
C329	0.728	0.728	0.727	0.725	0.722	0.724	0.723	0.72	0.718	0.716	0.722
330A	3.272	3.446	OVER	OVER	OVER	OVER	OVER	OVER	3.4	OVER	OVER
330B	3.301	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.494	OVER	OVER
C330	3.454	3.361	OVER	OVER	OVER	OVER	OVER	OVER	3.406	OVER	OVER
331A	0.736	0.734	0.732	0.722	0.713	0.698	0.671	0.716	0.682	0.682	0.49
331B	0.729	0.727	0.722	0.717	0.708	0.702	0.681	0.712	0.704	0.717	0.579
C331	0.739	0.734	0.731	0.728	0.725	0.718	0.688	0.693	0.662	0.678	0.673
332A	3.364	3.436	OVER	OVER	OVER	OVER	OVER	OVER	3.417	OVER	OVER
332B	3.318	3.448	OVER	OVER	OVER	OVER	OVER	OVER	3.364	OVER	OVER
C332	3.283	3.345	OVER	OVER	OVER	OVER	OVER	OVER	3.392	OVER	OVER
333A	0.348	0.34	0.337	0.335	0.328	0.321	0.317	0.313	0.313	0.294	0.257
333B	0.351	0.344	0.34	0.338	0.331	0.324	0.317	0.313	0.31	0.294	0.256
C333	0.352	0.349	0.347	0.344	0.341	0.343	0.34	0.337	0.335	0.335	0.338
334A	3.29	3.215	3.201	3.175	3.153	2.472	2.218	2.05	1.793	1.453	1.255
334B	3.229	3.169	3.165	3.163	3.135	2.575	2.204	2.006	1.679	1.345	1.141
C334	3.342	3.371	3.357	3.378	3.395	3.392	3.363	3.346	3.336	3.039	2.793
335A	0.368	0.361	0.357	0.354	0.343	0.327	0.302	0.291	0.289	0.314	0.283
335B	0.374	0.366	0.362	0.359	0.347	0.329	0.302	0.295	0.291	0.304	0.27
C335	0.377	0.374	0.371	0.364	0.356	0.337	0.309	0.334	0.276	0.303	0.297
336A	3.245	3.169	3.144	3.092	2.671	2.376	2.089	1.903	1.646	1.372	1.183
336B	3.235	3.182	3.186	3.16	3.132	3.057	2.326	1.983	1.763	1.215	1.027
C336	3.334	3.321	3.327	3.322	3.324	3.256	3.162	3.163	3.055	2.786	2.558
337A	0.687	0.685	0.684	0.678	0.668	0.664	0.661	0.661	0.671	0.703	0.689
337B	0.689	0.686	0.685	0.679	0.672	0.667	0.665	0.666	0.676	0.708	0.702
C337	0.702	0.708	0.702	0.699	0.697	0.705	0.697	0.694	0.701	0.702	0.71
338A	OVER	OVEr	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
338B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C338	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
339A	0.715	0.714	0.708	0.694	0.679	0.652	0.612	0.616	0.611	0.665	0.686
339B	0.715	0.714	0.711	0.702	0.691	0.673	0.656	0.689	0.667	0.72	0.719
C339	0.722	0.715	0.715	0.719	0.708	0.691	0.654	0.656	0.666	0.685	0.702
340A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
340B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C340	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
341A	0.354	0.349	0.348	0.342	0.337	0.337	0.339	0.342	0.347	0.306	0.278
341B	0.36	0.352	0.351	0.346	0.341	0.34	0.345	0.348	0.354	0.311	0.274
C341	0.367	0.364	0.362	0.361	0.363	0.361	0.359	0.358	0.357	0.354	0.355
342A	3.368	3.483	OVER	3.466	3.235	1.448	0.859	0.664	0.324	0.155	0.12
342B	3.41	OVER	OVER	OVER	OVER	1.511	0.916	0.719	0.336	0.154	0.113
C342	3.487	3.49	OVER	3.488	3.497	OVER	OVER	3.425	3.415	3.37	3.311
343A	0.374	0.366	0.364	0.354	0.324	0.322	0.307	0.304	0.303	0.774	0.193
343B	0.375	0.364	0.361	0.355	0.341	0.324	0.308	0.316	0.323	0.267	0.2
C343	0.386	0.381	0.377	0.37	0.354	0.326	0.323	0.327	0.284	0.25	0.258
344A	3.408	OVER	OVER	OVER	3.188	1.4	0.866	0.718	0.318	0.219	0.139
344B	3.384	3.463	OVER	3.447	2.632	1.39	1.073	0.728	0.394	0.354	0.16
C344	3.5	OVER	OVER	3.483	3.462	3.395	3.34	3.248	3.153	2.98	3.11
345A	0.342	0.339	0.338	0.333	0.322	0.312	0.313	0.312	0.291	0.26	0.239
345B	0.344	0.334	0.333	0.328	0.316	0.306	0.301	0.3	0.285	0.246	0.226
C345	0.354	0.351	0.35	0.348	0.348	0.344	0.347	0.344	0.342	0.337	0.335
346A	3.17	3.069	3.047	3.006	2.116	1.233	0.734	0.539	0.202	0.088	0.103
346B	3.171	3.094	3.058	2.978	2.079	1.384	0.778	0.528	0.215	0.099	0.084
C346	3.379	3.394	3.392	3.403	3.399	3.369	3.393	3.353	3.32	2.951	2.655
347A	0.371	0.362	0.359	0.35	0.33	0.301	0.29	0.319	0.295	0.234	0.186
347B	0.383	0.373	0.37	0.352	0.339	0.319	0.313	0.324	0.318	0.293	0.261
C347	0.406	0.396	0.392	0.389	0.363	0.349	0.308	0.291	0.284	0.256	0.259
348A	3.206	3.167	3.186	3.184	3.133	2.973	1.699	1.031	0.462	0.179	0.163
348B	3.165	3.11	3.115	3.065	2.964	1.581	1.087	0.797	2.863	1.385	0.367
C348	3.382	3.395	3.395	3.379	3.322	3.258	3.263	3.221	3.211	2.762	2.488
349A	0.371	0.368	0.366	0.365	0.363	0.362	0.362	0.362	0.358	0.31	0.295
349B	0.359	0.357	0.355	0.353	0.351	0.35	0.349	0.349	0.345	0.289	0.276
C349	0.367	0.366	0.367	0.366	0.364	0.363	0.362	0.362	0.362	0.36	0.356
350A	3.456	OVER	OVER	3.401	3.279	3.14	2.831	2.608	2.446	2.396	2.384
350B	3.432	OVER	3.454	3.325	3.186	3.057	2.736	2.464	2.362	2.295	2.287
C350	3.33	3.348	3.361	3.35	3.365	3.326	3.31	3.318	3.251	3.276	3.276
351A	0.389	0.385	0.383	0.378	0.374	0.368	0.346	0.332	0.287	0.255	0.24
351B	0.386	0.383	0.38	0.376	0.373	0.361	0.338	0.314	0.278	0.246	0.231
C351	0.391	0.391	0.388	0.383	0.379	0.372	0.357	0.349	0.332	0.323	0.312
352A	3.474	OVER	3.432	3.314	3.129	2.994	2.603	2.442	2.199	2.19	2.152
352B	3.48	OVER	3.441	3.315	3.173	2.955	2.553	2.374	2.152	2.162	2.126
C352	3.37	3.367	3.371	3.38	3.368	3.322	3.297	3.301	3.23	3.256	3.239
353A	0.333	0.326	0.324	0.322	0.316	0.309	0.244	0.156	0.096	0.035	0.02
353B	0.33	0.324	0.322	0.319	0.315	0.309	0.179	0.142	0.085	0.034	0.021
C353	0.327	0.322	0.32	0.317	0.312	0.306	0.218	0.166	0.106	0.058	0.032
354A	3.246	3.252	3.289	3.324	2.496	1.958	1.621	1.465	1.08	0.84	0.807
354B	3.232	3.241	3.266	3.279	2.472	2.009	1.549	1.407	0.983	0.741	0.691
C354	3.249	3.246	3.24	3.239	3.236	3.207	3.182	3.187	3.157	3.193	3.202
355A	0.36	0.352	0.348	0.343	0.335	0.296	0.151	0.13	0.096	0.034	0.021
355B	0.363	0.355	0.353	0.347	0.334	0.298	0.228	0.168	0.119	0.062	0.031
C355	0.372	0.364	0.359	0.353	0.34	0.314	0.203	0.162	0.119	0.074	0.049
356A	3.226	3.228	3.238	3.233	2.476	1.987	1.787	1.602	1.283	0.94	0.781
356B	3.23	3.22	3.232	3.19	2.335	1.938	1.523	1.344	0.966	0.723	0.631
C356	3.278	3.277	3.275	3.254	3.232	3.154	3.076	3.135	3.039	2.847	2.591

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
357A	0.363	0.362	0.359	0.356	0.352	0.347	0.342	0.339	0.334	0.331	0.33
357B	0.36	0.358	0.355	0.353	0.348	0.342	0.335	0.331	0.326	0.322	0.32
C357	0.364	0.363	0.362	0.36	0.356	0.353	0.351	0.347	0.344	0.337	0.336
358A	3.266	3.403	3.495	OVER	OVER	OVER	2.236	1.696	1.23	0.794	0.434
358B	3.264	3.379	OVER	OVER	OVER	OVER	2.249	1.734	1.189	0.776	0.405
C358	3.281	3.291	3.312	3.31	3.321	3.347	3.334	3.33	3.303	3.271	3.264
359A	0.406	0.401	0.397	0.392	0.385	0.371	0.35	0.337	0.314	0.292	0.297
359B	0.411	0.406	0.402	0.397	0.385	0.371	0.349	0.333	0.307	0.282	0.293
C359	0.399	0.395	0.393	0.388	0.382	0.37	0.349	0.336	0.309	0.287	0.305
360A	3.322	3.471	OVER	OVER	3.47	3.105	2.226	1.784	1.248	0.931	0.521
360B	3.346	3.474	OVER	OVER	OVER	3.276	2.261	1.88	1.334	0.974	0.578
C360	3.298	3.309	3.314	3.312	3.321	3.343	3.341	3.316	3.271	3.225	3.23
361A	0.727	0.723	0.719	0.714	0.707	0.699	0.69	0.687	0.684	0.677	0.674
361B	0.718	0.713	0.71	0.705	0.698	0.688	0.68	0.676	0.672	0.667	0.663
C361	0.734	0.731	0.728	0.727	0.725	0.72	0.714	0.712	0.709	0.701	0.694
362A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
362B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C362	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
363A	0.755	0.747	0.744	0.738	0.728	0.716	0.697	0.685	0.661	0.643	0.649
363B	0.769	0.763	0.759	0.752	0.74	0.722	0.699	0.686	0.655	0.638	0.649
C363	0.764	0.762	0.758	0.752	0.747	0.742	0.727	0.722	0.7	0.691	0.678
364A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
364B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C364	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
365A	0.358	0.353	0.349	0.347	0.342	0.335	0.326	0.324	0.319	0.317	0.319
365B	0.356	0.353	0.35	0.346	0.341	0.334	0.325	0.323	0.319	0.316	0.32
C365	0.361	0.361	0.357	0.356	0.353	0.349	0.345	0.343	0.338	0.334	0.331
366A	3.326	OVER	OVER	OVER	OVER	1.898	0.821	0.495	0.128	0.072	0.051
366B	3.285	OVER	OVER	OVER	OVER	1.868	0.731	0.406	0.114	0.055	0.037
C366	3.272	3.278	3.287	3.3	3.32	3.318	3.308	3.301	3.239	3.27	3.228
367A	0.396	0.392	0.388	0.383	0.376	0.365	0.353	0.346	0.329	0.32	0.312
367B	0.395	0.39	0.386	0.382	0.376	0.365	0.352	0.344	0.329	0.315	0.318
C367	0.391	0.389	0.386	0.384	0.38	0.372	0.361	0.358	0.344	0.329	0.323
368A	3.396	OVER	OVER	3.406	2.995	1.936	0.738	0.374	0.116	0.077	0.045
368B	3.378	OVER	OVER	3.43	3.064	1.842	0.731	0.361	0.116	0.067	0.048
C368	3.302	3.311	3.315	3.321	3.317	3.327	3.315	3.301	3.232	3.22	3.205
369A	0.358	0.352	0.348	0.344	0.331	0.315	0.297	0.292	0.282	0.277	0.275
369B	0.355	0.349	0.344	0.341	0.327	0.317	0.293	0.286	0.276	0.271	0.268
C369	0.359	0.355	0.354	0.353	0.35	0.348	0.348	0.347	0.346	0.348	0.348
370A	3.144	3.083	3.074	3.102	3.121	3.115	3.121	3.101	2.766	1.941	1.879
370B	3.183	3.117	3.12	3.145	3.145	3.147	3.162	3.135	2.72	1.925	1.897
C370	3.261	3.227	3.232	3.263	3.305	3.306	3.347	3.302	2.937	3.072	3.25
371A	0.388	0.381	0.378	0.369	0.355	0.332	0.305	0.297	0.275	0.261	0.257
371B	0.391	0.387	0.381	0.37	0.355	0.331	0.299	0.29	0.265	0.248	0.242
C371	0.4	0.395	0.391	0.386	0.386	0.379	0.37	0.366	0.357	0.351	0.352
372A	3.183	3.11	3.085	3.114	3.108	3.093	3.054	3.023	2.637	1.791	1.736
372B	3.193	3.125	3.108	3.113	3.104	3.09	3.058	3.017	2.396	1.781	1.729
C372	3.319	3.275	3.28	3.304	3.328	3.349	3.378	3.325	2.933	3.062	3.219
373A	0.709	0.701	0.694	0.683	0.666	0.644	0.626	0.621	0.614	0.611	0.608
373B	0.716	0.706	0.699	0.688	0.672	0.648	0.633	0.624	0.617	0.613	0.613
C373	0.725	0.721	0.718	0.716	0.716	0.714	0.713	0.713	0.713	0.716	0.716
374A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.175	3.328	OVER
374B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.204	3.378	OVER
C374	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.138	3.397	OVER
375A	0.756	0.746	0.736	0.723	0.705	0.678	0.647	0.643	0.616	0.6	0.6
375B	0.76	0.75	0.741	0.727	0.703	0.674	0.643	0.637	0.606	0.586	0.576
C375	0.763	0.762	0.759	0.755	0.753	0.744	0.732	0.729	0.711	0.703	0.709
376A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.344	OVER
376B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.355	OVER
C376	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.398	OVER
377A	0.356	0.351	0.349	0.342	0.332	0.324	0.314	0.312	0.305	0.303	0.303
377B	0.357	0.352	0.349	0.343	0.332	0.322	0.314	0.311	0.306	0.298	0.308
C377	0.362	0.36	0.36	0.359	0.357	0.358	0.356	0.354	0.353	0.352	0.351
378A	2.892	2.933	3.073	3.129	3.094	2.928	2.425	2.303	2.163	2.143	2.141
378B	2.82	2.931	3.017	3.094	3.031	2.868	2.38	2.255	2.125	2.097	2.095
C378	2.87	2.94	3.024	3.21	3.371	3.423	3.468	3.434	3.094	3.165	3.209
379A	0.376	0.37	0.367	0.357	0.343	0.328	0.311	0.298	0.271	0.264	0.227
379B	0.384	0.378	0.374	0.365	0.349	0.333	0.315	0.302	0.275	0.262	0.216
C379	0.404	0.398	0.395	0.391	0.383	0.377	0.366	0.353	0.316	0.319	0.305
380A	2.899	2.928	2.983	3.029	2.926	2.564	2.152	2.01	1.854	1.801	1.788
380B	2.88	2.939	2.995	3.054	2.966	2.585	2.172	2.033	1.877	1.837	1.823
C380	2.905	2.98	3.059	3.223	3.376	3.411	3.404	3.371	3.074	3.145	3.16
381A	0.707	0.699	0.693	0.683	0.671	0.662	0.657	0.653	0.649	0.647	0.656
381B	0.706	0.701	0.693	0.686	0.675	0.666	0.66	0.658	0.654	0.653	0.656
C381	0.715	0.713	0.713	0.713	0.713	0.712	0.709	0.709	0.707	0.707	0.704
382A	3.045	3.092	3.3	OVER	OVER	OVER	OVER	OVER	3.301	3.44	3.473
382B	3.056	3.175	3.328	OVER	OVER	OVER	OVER	OVER	3.317	3.436	3.473
C382	3.059	3.233	3.255	OVER	OVER	OVER	OVER	OVER	3.346	3.423	OVER
383A	0.746	0.738	0.73	0.718	0.7	0.683	0.668	0.656	0.624	0.621	0.555
383B	0.748	0.74	0.734	0.721	0.703	0.686	0.667	0.653	0.623	0.62	0.554
C383	0.759	0.755	0.753	0.75	0.744	0.735	0.724	0.718	0.691	0.684	0.672
384A	3.176	3.221	3.357	OVER	OVER	OVER	OVER	OVER	3.292	3.396	3.454
384B	3.09	3.166	3.31	OVER	OVER	OVER	OVER	OVER	3.287	3.424	3.447
C384	3.053	3.125	3.24	OVER	OVER	OVER	OVER	OVER	3.335	3.481	3.5
385A	0.354	0.345	0.336	0.325	0.302	0.261	0.224	0.199	0.171	0.159	0.154
385B	0.351	0.343	0.336	0.324	0.3	0.265	0.223	0.198	0.171	0.157	0.152
C385	0.364	0.362	0.359	0.357	0.358	0.357	0.353	0.353	0.353	0.353	0.354

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
386A	2.769	2.785	2.757	2.742	2.814	2.913	2.702	2.351	1.929	1.522	1.048
386B	2.785	2.758	2.749	2.745	2.817	2.925	2.748	2.527	2.148	1.602	1.128
C386	2.927	3.018	3.113	3.218	3.361	3.399	3.412	3.413	3.042	3.263	3.167
387A	0.387	0.377	0.368	0.356	0.328	0.289	0.234	0.201	0.158	0.141	0.131
387B	0.387	0.375	0.366	0.352	0.326	0.284	0.23	0.197	0.154	0.136	0.128
C387	0.384	0.383	0.38	0.377	0.374	0.368	0.359	0.348	0.336	0.342	0.345
388A	2.794	2.799	2.777	2.758	2.808	2.863	2.401	1.443	0.938	0.624	0.403
388B	2.774	2.778	2.764	2.74	2.793	2.877	1.946	0.892	0.541	0.335	0.24
C388	2.995	3.068	3.126	3.24	3.371	3.426	3.423	3.405	3.062	3.23	3.161
389A	0.352	0.344	0.337	0.33	0.319	0.312	0.304	0.303	0.293	0.18	0.13
389B	0.349	0.344	0.335	0.325	0.314	0.301	0.299	0.297	0.294	0.232	0.15
C389	0.363	0.361	0.363	0.359	0.358	0.358	0.355	0.356	0.353	0.353	0.349
390A	2.926	2.868	2.793	2.582	2.197	1.299	0.703	0.501	0.364	0.293	0.255
390B	2.93	2.862	2.786	2.576	2.202	1.304	0.694	0.492	0.36	0.287	0.249
C390	2.979	3.056	3.129	3.191	3.325	3.325	3.379	3.376	3.072	3.259	3.156
391A	0.4	0.39	0.378	0.368	0.35	0.331	0.303	0.292	0.169	0.097	0.071
391B	0.389	0.378	0.372	0.362	0.349	0.334	0.311	0.3	0.174	0.103	0.078
C391	0.388	0.385	0.383	0.38	0.377	0.373	0.36	0.357	0.34	0.325	0.316
392A	2.942	2.842	2.729	2.512	2.018	1.11	0.554	0.333	0.191	0.116	0.111
392B	2.916	2.819	2.714	2.48	1.975	1.076	0.507	0.286	0.164	0.112	0.099
C392	2.975	3.08	3.163	3.192	3.319	3.366	3.353	3.336	3.044	3.231	3.112
393A	0.346	0.342	0.341	0.333	0.326	0.317	0.313	0.314	0.294	0.263	0.245
393B	0.347	0.344	0.341	0.334	0.326	0.318	0.312	0.311	0.29	0.261	0.242
C393	0.35	0.351	0.349	0.345	0.341	0.334	0.33	0.326	0.317	0.311	0.282
394A	2.897	2.785	2.674	2.459	2.088	1.7	1.622	1.604	1.521	1.446	1.4
394B	2.895	2.77	2.677	2.463	2.095	1.7	1.622	1.602	1.52	1.452	1.409
C394	2.97	2.98	3.056	3.289	3.352	3.345	3.243	3.139	2.584	2.06	1.712
395A	0.372	0.369	0.365	0.356	0.347	0.333	0.32	0.32	0.294	0.261	0.242
395B	0.37	0.37	0.363	0.354	0.342	0.324	0.31	0.303	0.283	0.251	0.234
C395	0.4	0.397	0.393	0.386	0.375	0.354	0.331	0.32	0.286	0.292	0.273
396A	2.913	2.809	2.687	2.468	2.12	1.746	1.655	1.636	1.54	1.452	1.396
396B	2.897	2.77	2.687	2.467	2.098	1.732	1.647	1.625	1.535	1.454	1.389
C396	2.978	2.968	3.097	3.31	3.367	3.387	3.262	3.148	2.608	2.104	1.716
397A	0.71	0.704	0.696	0.688	0.675	0.664	0.657	0.651	0.627	0.564	0.519
397B	0.718	0.711	0.705	0.696	0.683	0.671	0.656	0.653	0.626	0.563	0.522
C397	0.716	0.717	0.71	0.708	0.702	0.694	0.682	0.683	0.663	0.637	0.617
398A	3.167	3.198	3.337	OVER	OVER	OVER	OVER	OVER	2.949	3.025	3.121
398B	3.189	3.226	3.449	OVER	OVER	OVER	OVER	OVER	2.951	3.06	3.144
C398	3.167	3.212	3.35	OVER	OVER	OVER	OVER	OVER	3.232	3.398	OVER
399A	0.75	0.744	0.734	0.721	0.709	0.685	0.661	0.655	0.637	0.566	0.522
399B	0.738	0.731	0.723	0.712	0.7	0.677	0.652	0.647	0.621	0.563	0.508
C399	0.754	0.75	0.746	0.737	0.73	0.713	0.698	0.686	0.636	0.624	0.596
400A	3.192	3.237	3.4	OVER	OVER	OVER	OVER	OVER	3.016	3.071	3.173
400B	3.182	3.244	3.402	OVER	OVER	OVER	OVER	OVER	2.988	3.099	3.159
C400	3.17	3.215	3.356	OVER	OVER	OVER	OVER	OVER	3.256	3.441	OVER
401A	0.37	0.367	0.365	0.36	0.352	0.337	0.322	0.314	0.3	0.296	0.294
401B	0.365	0.364	0.362	0.355	0.347	0.334	0.32	0.311	0.299	0.297	0.293
C401	0.364	0.365	0.364	0.365	0.363	0.361	0.358	0.358	0.353	0.344	0.337
402A	2.959	2.888	2.874	2.875	2.795	2.714	2.66	2.573	2.337	2.16	2.018
402B	2.965	2.874	2.852	2.84	2.764	2.68	2.615	2.527	2.289	2.158	2.025
C402	3.023	3.04	3.1	3.287	3.393	3.443	3.432	3.419	2.998	3.191	2.907
403A	0.398	0.395	0.389	0.384	0.366	0.345	0.318	0.306	0.277	0.272	0.255
403B	0.388	0.385	0.381	0.375	0.362	0.341	0.315	0.301	0.273	0.265	0.26
C403	0.393	0.391	0.389	0.386	0.381	0.372	0.358	0.363	0.338	0.327	0.311
404A	2.932	2.863	2.856	2.853	2.766	2.657	2.599	2.559	2.323	2.135	1.966
404B	2.958	2.864	2.857	2.849	2.772	2.647	2.608	2.573	2.315	2.135	1.94
C404	3.07	3.007	3.101	3.289	3.374	3.421	3.398	3.378	3.018	3.095	2.852
405A	0.723	0.719	0.712	0.706	0.692	0.676	0.669	0.658	0.65	0.65	0.655
405B	0.732	0.727	0.723	0.713	0.701	0.684	0.671	0.666	0.657	0.664	0.677
C405	0.737	0.734	0.733	0.736	0.732	0.73	0.73	0.726	0.721	0.709	0.702
406A	3.223	3.274	3.365	OVER	OVER	OVER	OVER	OVER	2.213	1.307	0.851
406B	3.231	3.24	3.392	OVER	OVER	OVER	OVER	OVER	2.153	1.304	0.814
C406	3.216	3.246	3.374	OVER	OVER	OVER	OVER	OVER	3.329	OVER	3.206
407A	0.755	0.749	0.741	0.733	0.708	0.683	0.655	0.659	0.627	0.608	0.621
407B	0.755	0.751	0.742	0.726	0.713	0.691	0.66	0.651	0.619	0.611	0.636
C407	0.755	0.754	0.753	0.744	0.743	0.733	0.716	0.709	0.7	0.676	0.659
408A	3.266	3.237	3.391	OVER	OVER	OVER	OVER	OVER	2.386	1.519	1.03
408B	3.242	3.269	3.418	OVER	OVER	OVER	OVER	OVER	2.366	1.496	0.993
C408	3.227	3.264	3.358	OVER	OVER	OVER	OVER	OVER	3.307	OVER	3.26
409A	0.344	0.339	0.334	0.325	0.316	0.312	0.311	0.304	0.274	0.244	0.228
409B	0.341	0.335	0.333	0.324	0.316	0.314	0.313	0.302	0.272	0.242	0.227
C409	0.352	0.347	0.348	0.345	0.34	0.336	0.33	0.326	0.323	0.317	0.292
410A	2.833	2.551	2.266	1.931	1.681	1.567	1.491	1.436	1.342	1.24	1.191
410B	2.818	2.532	2.243	1.916	1.671	1.556	1.483	1.429	1.337	1.238	1.188
C410	2.996	3.065	3.095	3.198	3.312	3.316	3.251	3.077	2.582	1.931	1.662
411A	0.362	0.357	0.351	0.34	0.326	0.314	0.301	0.297	0.269	0.244	0.224
411B	0.37	0.365	0.358	0.349	0.337	0.324	0.314	0.307	0.286	0.257	0.23
C411	0.391	0.386	0.384	0.379	0.369	0.354	0.332	0.319	0.303	0.293	0.279
412A	2.819	2.545	2.252	1.92	1.681	1.57	1.5	1.457	1.375	1.289	1.241
412B	2.823	2.543	2.27	1.936	1.692	1.575	1.504	1.455	1.365	1.279	1.232
C412	3.049	3.11	3.146	3.25	3.369	3.36	3.262	3.07	2.533	1.865	1.606
413A	0.374	0.365	0.364	0.357	0.338	0.318	0.307	0.301	0.292	0.259	0.245
413B	0.361	0.358	0.353	0.344	0.332	0.311	0.298	0.291	0.287	0.251	0.24
C413	0.376	0.376	0.374	0.373	0.372	0.37	0.368	0.366	0.363	0.353	0.348
414A	2.854	2.773	2.701	2.677	2.658	2.554	2.35	2.228	2.055	1.871	1.782
414B	2.886	2.806	2.727	2.699	2.68	2.585	2.368	2.26	2.081	1.906	1.808
C414	3.031	3.106	3.154	3.238	3.368	3.421	3.461	3.416	3.199	2.931	2.943

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
415A	0.397	0.391	0.384	0.375	0.356	0.331	0.306	0.299	0.286	0.247	0.227
415B	0.396	0.39	0.383	0.371	0.354	0.322	0.29	0.278	0.255	0.238	0.221
C415	0.396	0.392	0.39	0.386	0.382	0.369	0.353	0.35	0.335	0.318	0.303
416A	2.893	2.816	2.748	2.7	2.672	2.549	2.362	2.273	2.102	1.934	1.789
416B	2.866	2.819	2.745	2.707	2.657	2.526	2.358	2.269	2.121	1.932	1.833
C416	3.03	3.135	3.153	3.252	3.375	3.431	3.436	3.434	3.206	2.918	2.904
417A	0.371	0.37	0.368	0.365	0.362	0.357	0.353	0.352	0.35	0.348	0.349
417B	0.372	0.371	0.369	0.365	0.362	0.356	0.353	0.352	0.352	0.352	0.349
C417	0.374	0.373	0.374	0.373	0.372	0.371	0.371	0.37	0.37	0.368	0.367
418A	3.125	3.111	3.209	3.487	OVER	OVER	OVER	2.426	2.08	1.876	1.78
418B	3.088	3.112	3.217	3.498	OVER	OVER	OVER	2.422	2.083	1.888	1.784
C418	3.128	3.209	3.22	3.357	3.419	3.476	3.485	3.479	3.262	3.364	3.27
419A	0.393	0.39	0.43	0.385	0.379	0.367	0.356	0.347	0.329	0.339	0.332
419B	0.39	0.388	0.386	0.381	0.375	0.363	0.352	0.343	0.326	0.335	0.329
C419	0.402	0.399	0.397	0.396	0.391	0.382	0.371	0.366	0.354	0.356	0.346
420A	3.127	3.156	3.233	OVER	OVER	OVER	OVER	2.248	1.938	1.751	1.636
420B	3.1	3.155	3.255	OVER	OVER	OVER	OVER	2.298	1.941	1.776	1.65
C420	3.164	3.173	3.198	3.373	3.4						
421A	0.729	0.726	0.726	0.722	0.715	0.71	0.709	0.708	0.708	0.707	0.705
421B	0.725	0.723	0.721	0.716	0.712	0.708	0.703	0.704	0.704	0.704	0.701
C421	0.73	0.732	0.731	0.731	0.73	0.728	0.726	0.726	0.726	0.722	0.722
422A	3.453	3.489	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
422B	3.487	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C422	3.477	3.454	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
423A	0.756	0.753	0.75	0.743	0.735	0.723	0.708	0.698	0.676	0.671	0.683
423B	0.762	0.759	0.752	0.746	0.739	0.727	0.711	0.707	0.693	0.691	0.684
C423	0.764	0.759	0.758	0.757	0.751	0.741	0.728	0.725	0.702	0.699	0.693
424A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
424B	3.439	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C424	3.465	3.471	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
425A	0.359	0.357	0.355	0.35	0.347	0.338	0.331	0.327	0.323	0.316	0.307
425B	0.354	0.352	0.351	0.345	0.342	0.335	0.33	0.328	0.324	0.32	0.314
C425	0.357	0.356	0.355	0.354	0.35	0.346	0.345	0.343	0.342	0.337	0.331
426A	3.247	3.203	3.202	3.229	3.242	3.26	3.163	2.284	1.655	1.439	1.169
426B	3.284	3.242	3.243	3.264	3.284	3.318	3.291	3.202	1.885	1.548	1.272
C426	3.362	3.355	3.372	3.308	3.306	3.292	3.252	3.25	3.338	3.338	3.367
427A	0.391	0.387	0.383	0.377	0.37	0.354	0.336	0.324	0.302	0.314	0.296
427B	0.391	0.384	0.384	0.372	0.364	0.349	0.335	0.344	0.311	0.313	0.297
C427	0.393	0.391	0.387	0.385	0.378	0.367	0.357	0.358	0.339	0.33	0.309
428A	3.311	3.264	3.264	3.259	3.263	3.22	3.203	2.464	1.669	1.44	1.192
428B	3.261	3.236	3.228	3.254	3.242	3.254	3.13	2.816	1.669	1.409	1.195
C428	3.41	3.423	3.418	3.434	3.418	3.399	3.36	3.337	3.278	3.318	3.35
429A	0.696	0.692	0.688	0.682	0.675	0.663	0.659	0.655	0.649	0.646	0.639
429B	0.703	0.701	0.697	0.695	0.685	0.676	0.671	0.67	0.667	0.661	0.656
C429	0.705	0.706	0.702	0.706	0.698	0.694	0.689	0.69	0.689	0.685	0.68
430A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
430B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C430	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
431A	0.723	0.719	0.715	0.706	0.698	0.677	0.658	0.661	0.641	0.634	0.619
431B	0.723	0.718	0.712	0.702	0.693	0.672	0.654	0.66	0.644	0.633	0.62
C431	0.731	0.731	0.725	0.719	0.718	0.706	0.689	0.688	0.676	0.665	0.646
432A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
432B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C432	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
433A	0.367	0.363	0.36	0.355	0.35	0.346	0.34	0.342	0.342	0.34	0.338
433B	0.364	0.36	0.356	0.353	0.347	0.34	0.334	0.334	0.335	0.334	0.331
C433	0.365	0.365	0.364	0.363	0.362	0.361	0.359	0.359	0.358	0.356	0.354
434A	3.326	OVER	OVER	OVER	OVER	OVER	1.38	0.982	0.604	0.356	0.299
434B	3.371	OVER	OVER	OVER	OVER	OVER	1.373	1.022	0.617	0.405	0.298
C434	3.392	3.402	3.457	OVER	OVER	OVER	OVER	3.454	3.429	3.43	3.473
435A	0.386	0.383	0.38	0.373	0.366	0.356	0.347	0.346	0.332	0.325	0.313
435B	0.395	0.392	0.387	0.382	0.373	0.362	0.347	0.348	0.332	0.317	0.308
C435	0.4	0.398	0.397	0.394	0.388	0.38	0.367	0.366	0.339	0.324	0.315
436A	3.338	OVER	OVER	OVER	OVER	OVER	1.318	0.86	0.468	0.269	0.187
436B	3.405	OVER	OVER	OVER	OVER	OVER	1.301	0.875	0.467	0.193	0.154
C436	3.458	3.432	3.423	3.499	OVER	OVER	3.487	3.476	3.405	3.336	3.401
437A	0.359	0.358	0.355	0.348	0.341	0.333	0.321	0.318	0.31	0.306	0.302
437B	0.355	0.352	0.349	0.344	0.337	0.33	0.322	0.319	0.317	0.312	0.308
C437	0.356	0.354	0.355	0.355	0.351	0.349	0.347	0.347	0.344	0.34	0.335
438A	3.155	3.236	3.321	OVER	OVER	OVER	OVER	3.375	0.59	0.194	0.126
438B	3.153	3.242	3.363	OVER	OVER	OVER	OVER	OVER	0.557	0.235	0.117
C438	3.308	3.338	3.349	3.373	OVER	OVER	3.424	3.369	3.391	3.415	3.403
439A	0.374	0.371	0.368	0.362	0.35	0.339	0.323	0.325	0.308	0.297	0.294
439B	0.37	0.365	0.362	0.352	0.344	0.332	0.324	0.32	0.305	0.3	0.297
C439	0.396	0.395	0.388	0.385	0.379	0.373	0.365	0.355	0.319	0.301	0.301
440A	3.216	3.239	3.331	3.492	OVER	OVER	OVER	1.296	0.401	0.194	0.112
440B	3.256	3.326	3.421	OVER	OVER	OVER	OVER	3.419	0.503	0.25	0.194
C440	3.362	3.366	3.396	3.403	3.454	OVER	3.415	3.37	3.307	3.309	3.298
441A	0.369	0.364	0.356	0.354	0.36	0.357	0.357	0.356	0.348	0.259	0.233
441B	0.36	0.357	0.35	0.347	0.349	0.35	0.35	0.349	0.338	0.237	0.217
C441	0.366	0.367	0.366	0.367	0.366	0.365	0.364	0.364	0.365	0.362	0.358
442A	3.04	2.971	2.958	2.977	3.005	2.952	2.808	2.493	2.284	2.216	2.199
442B	3.005	2.944	2.928	2.942	2.956	2.917	2.77	2.453	2.248	2.167	2.161
C442	3.181	3.2	3.227	3.241	3.247	3.261	3.246	3.26	3.221	3.219	3.238
443A	0.377	0.371	0.364	0.353	0.343	0.323	0.271	0.235	0.148	0.075	0.077
443B	0.383	0.377	0.366	0.358	0.349	0.325	0.268	0.216	0.142	0.06	0.069
C443	0.387	0.386	0.379	0.375	0.365	0.343	0.301	0.264	0.205	0.184	0.236

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
444A	3.073	3.026	3.002	3.011	2.999	2.843	2.514	2.284	1.992	1.867	1.994
444B	3.069	3.017	2.994	3.001	2.976	2.811	2.511	2.322	1.992	1.97	1.953
C444	3.207	3.228	3.258	3.25	3.258	3.229	3.194	3.195	3.102	3.116	3.141
445A	0.726	0.72	0.712	0.711	0.716	0.716	0.713	0.705	0.688	0.595	0.578
445B	0.734	0.729	0.721	0.718	0.725	0.726	0.72	0.714	0.69	0.599	0.582
C445	0.73	0.729	0.727	0.729	0.727	0.725	0.725	0.726	0.726	0.724	0.719
446A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
446B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C446	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
447A	0.737	0.729	0.717	0.71	0.705	0.676	0.625	0.572	0.486	0.415	0.436
447B	0.757	0.746	0.734	0.725	0.718	0.686	0.618	0.563	0.468	0.442	0.455
C447	0.773	0.768	0.762	0.758	0.753	0.744	0.707	0.658	0.602	0.639	0.614
448A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
448B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C448	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
449A	0.277	0.231	0.192	0.138	0.049	0.001	0.002	0.001	0.001	0.002	0.003
449B	0.269	0.22	0.18	0.127	0.04	0.001	0.002	0.002	0.002	0.002	0.002
C449	0.273	0.228	0.191	0.14	0.054	0.003	0.003	0.003	0.003	0.004	0.004
450A	2.911	2.649	2.517	2.348	2.135	1.981	1.669	0.339	0.103	0.025	0.008
450B	2.909	2.653	2.523	2.355	2.142	1.992	1.665	0.358	0.201	0.028	0.011
C450	3.11	3.034	2.974	2.94	2.783	2.585	2.503	2.346	1.011	0.134	0.036
451A	0.304	0.252	0.21	0.153	0.064	0.028	0.028	0.024	0.022	0.017	0.013
451B	0.311	0.252	0.208	0.15	0.062	0.032	0.029	0.027	0.024	0.021	0.016
C451	0.32	0.267	0.225	0.171	0.079	0.029	0.026	0.023	0.021	0.018	0.013
452A	2.905	2.662	2.55	2.4	2.23	1.904	0.636	0.326	0.174	0.043	0.016
452B	2.974	2.726	2.618	2.464	2.257	2.081	0.914	0.371	0.113	0.039	0.01
C452	3.126	3.046	2.973	2.934	2.815	2.604	2.197	1.317	0.531	0.21	0.08
453A	0.586	0.518	0.454	0.358	0.194	0.143	0.11	0.085	0.057	0.032	0.015
453B	0.593	0.531	0.466	0.369	0.222	0.198	0.152	0.123	0.087	0.049	0.023
C453	0.596	0.536	0.476	0.381	0.192	0.07	0.048	0.036	\.023	0.012	0.008
454A	OVER	OVER	OVER	OVER	OVER	OVER	1.753	1.302	0.845	0.488	0.235
454B	OVER	OVER	OVER	OVER	OVER	OVER	1.675	1.206	0.825	0.475	0.215
C454	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.287	2.41	1.253	0.562
455A	0.626	0.553	0.485	0.382	0.194	0.132	0.081	0.05	0.024	0.009	0.008
455B	0.643	0.574	0.509	0.411	0.233	0.232	0.166	0.106	0.046	0.014	0.008
C455	0.663	0.61	0.549	0.462	0.268	0.107	0.089	0.073	0.031	0.009	0.004
456A	OVER	OVER	OVER	OVER	OVER	2.556	1.982	1.549	0.916	0.476	0.19
456B	OVER	OVER	OVER	OVER	OVER	2.657	1.755	1.311	0.859	0.474	0.227
C456	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.447	2.556	1.437	0.738
457A	0.344	0.328	0.315	0.298	0.334	0.394	0.318	0.258	0.153	0.076	0.018
457B	0.343	0.327	0.312	0.294	0.329	0.385	0.301	0.239	0.127	0.058	0.021
C457	0.344	0.331	0.32	0.296	0.257	0.354	0.292	0.238	0.126	0.053	0.026
458A	3.139	3.009	2.947	2.914	2.819	2.706	1.374	0.525	0.127	0.048	0.018
458B	3.12	2.984	2.924	2.897	2.816	2.698	1.437	0.557	0.139	0.086	0.04
C458	3.269	3.269	3.275	3.268	3.261	3.357	3.23	2.781	1.068	0.291	0.086
459A	0.388	0.367	0.35	0.362	0.347	0.388	0.298	0.244	0.113	0.022	0.006
459B	0.374	0.352	0.333	0.305	0.294	0.338	0.263	0.202	0.112	0.026	0.01
C459	0.382	0.364	0.349	0.321	0.272	0.358	0.297	0.237	0.143	0.038	0.011
460A	3.186	3.056	2.984	2.956	2.839	2.528	1.34	0.53	1.72	0.048	0.018
460B	3.158	3.037	2960	2.951	2.88	2.732	1.61	0.696	0.215	0.062	0.037
C460	3.31	3.31	3.297	3.285	3.281	3.263	3.024	2.088	0.906	0.18	0.067
461A	0.693	0.672	0.658	0.678	0.743	0.799	0.716	0.584	0.323	0.094	0.027
461B	0.697	0.675	0.661	0.676	0.743	0.796	0.705	0.572	0.312	0.093	0.025
C461	0.713	0.698	0.685	0.673	0.763	0.822	0.856	0.755	0.48	0.215	0.063
462A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.041	1.89	1.168
462B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.881	1.664	1.026
C462	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.153	2.533
463A	0.727	0.701	0.685	0.691	0.756	0.803	0.735	0.592	0.326	0.069	0.032
463B	0.756	0.731	0.72	0.738	0.775	0.788	0.725	0.612	0.359	0.072	0.025
C463	0.75	0.735	0.72	0.702	0.782	0.809	0.796	0.742	0.461	0.138	0.051
464A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.978	1.926	1.231
464B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.996	1.916	1.244
C464	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.159	2.544
465A	0.359	0.356	0.353	0.348	0.341	0.329	0.315		0.299	0.292	0.291
465B	0.36	0.357	0.353	0.348	0.341	0.33	0.315		0.299	0.291	0.29
C465	0.365	0.365	0.363	0.363	0.362	0.361	0.36		0.357	0.355	0.356
466A	2.932	2.813	2.737	2.66	2.544	2.44	2.406		2.366	2.331	2.295
466B	2.935	2.826	2.747	2.671	2.556	2.451	2.44		2.374	2.349	2.31
C466	3.057	3.076	3.099	3.213	3.245	3.268	3.294		3.248	3.195	3.039
467A	0.389	0.384	0.378	0.369	0.354	0.328	0.287		0.203	0.148	0.121
467B	0.389	0.384	0.38	0.371	0.357	0.331	0.293		0.21	0.171	0.152
C467	0.39	0.391	0.385	0.383	0.378	0.366	0.347		0.291	0.257	0.242
468A	2.978	2.856	2.768	2.658	2.504	2.337	2.188		2.056	2.01	1.923
468B	2.94	2.841	2.755	2.657	2.533	2.414	2.293		2.252	2.176	2.129
C468	3.133	3.147	3.175	3.252	3.275	3.272	3.243		3.092	3.04	2.902
469A	0.724	0.715	0.708	0.702	0.693	0.68	0.666		0.653	0.652	0.651
469B	0.725	0.719	0.711	0.703	0.691	0.68	0.668		0.651	0.647	0.647
C469	0.733	0.731	0.731	0.729	0.727	0.727	0.724		0.724	0.719	0.716
470A	3.32	3.38	3.427	OVER	OVER	OVER	OVER		OVER	OVER	3.315
470B	3.373	3.39	3.437	OVER	OVER	OVER	OVER		OVER	OVER	3.332
C470	3.34	3.424	3.454	OVER	OVER	OVER	OVER		OVER	OVER	3.345
471A	0.763	0.756	0.747	0.733	0.713	0.679	0.631		0.512	0.44	0.417
471B	0.756	0.747	0.738	0.725	0.708	0.679	0.631		0.507	0.443	0.425
C471	0.761	0.755	0.752	0.749	0.742	0.729	0.702		0.643	0.577	0.551
472A	3.411	3.405	OVER	OVER	OVER	OVER	OVER		OVER	OVER	3.332
472B	3.345	3.42	3.496	OVER	OVER	OVER	OVER		OVER	OVER	3.33
C472	3.37	3.491	OVER	OVER	OVER	OVER	OVER		OVER	OVER	3.335

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
473A	0.351	0.349	0.347	0.34	0.33	0.32	0.319	0.315	0.3	0.26	0.251
473B	0.348	0.346	0.344	0.337	0.327	0.316	0.317	0.314	0.294	0.252	0.244
C473	0.349	0.348	0.348	0.349	0.348	0.346	0.345	0.343	0.342	0.337	0.334
474A	2.781	2.718	2.76	2.859	2.86	2.693	2.119	1.868	1.709	1.653	1.651
474B	2.781	2.738	2.782	2.85	2.86	2.723	2.08	1.87	1.717	1.653	1.647
C474	2.945	2.979	3.027	3.132	3.208	3.228	3.233	3.214	2.939	2.988	3.083
475A	0.377	0.37	0.363	0.353	0.335	0.307	0.279	0.241	0.175	0.096	0.085
475B	0.376	0.368	0.363	0.353	0.335	0.304	0.277	0.271	0.191	0.104	0.092
C475	0.38	0.376	0.375	0.368	0.357	0.331	0.297	0.299	0.236	0.187	0.182
476A	2.798	2.76	2.816	2.842	2.808	2.392	1.925	1.682	1.47	1.39	1.375
476B	2.798	2.75	2.794	2.851	2.811	2.42	1.934	1.703	1.442	1.316	1.333
C476	2.967	3.008	3.041	3.138	3.193	3.186	3.168	3.206	2.904	2.886	2.97
477A	0.702	0.694	0.689	0.683	0.671	0.666	0.672	0.659	0.642	0.607	0.599
477B	0.71	0.703	0.699	0.691	0.679	0.673	0.682	0.673	0.653	0.615	0.607
C477	0.707	0.707	0.709	0.709	0.706	0.704	0.704	0.704	0.702	0.695	0.692
478A	3.185	3.297	3.402	OVER	OVER	OVER	OVER	OVER	3.269	3.212	3.481
478B	3.208	3.31	3.436	OVER	OVER	OVER	OVER	OVER	3.222	3.204	3.457
C478	3.204	3.272	3.36	OVER	OVER	OVER	OVER	OVER	3.224	3.275	OVER
479A	0.728	0.718	0.708	0.692	0.67	0.646	0.606	0.575	0.485	0.419	0.433
479B	0.736	0.724	0.715	0.697	0.678	0.642	0.586	0.524	0.435	0.38	0.426
C479	0.728	0.726	0.723	0.717	0.707	0.691	0.663	0.628	0.572	0.517	0.585
480A	3.208	3.386	OVER	OVER	OVER	OVER	OVER	OVER	3.208	3.309	3.429
480B	3.186	3.333	OVER	OVER	OVER	OVER	OVER	OVER	3.218	3.265	3.329
C480	3.201	3.298	3.387	OVER	OVER	OVER	OVER	OVER	3.281	3.318	OVER
481A	0.317	0.301	0.29	0.276	0.255	0.223	0.172	0.141	0.106	0.083	0.066
481B	0.324	0.302	0.29	0.279	0.254	0.222	0.177	0.139	0.104	0.081	0.061
C481	0.322	0.308	0.3	0.292	0.281	0.266	0.233	0.194	0.131	0.1	0.079
482A	2.985	2.759	2.564	2.381	2.014	1.559	1.344	1.246	1.09	0.957	0.864
482B	3.013	2.788	2.601	2.416	2.033	1.576	1.347	1.262	1.098	0.969	0.882
C482	3.222	3.246	3.204	3.32	3.336	3.271	2.809	2.134	1.612	1.465	1.344
483A	0.33	0.312	0.298	0.282	0.255	0.215	0.164	0.142	0.11	0.091	0.067
483B	0.333	0.317	0.303	0.287	0.259	0.221	0.172	0.147	0.115	0.094	0.076
C483	0.338	0.327	0.336	0.304	0.3	0.256	0.219	0.26	0.128	0.107	0.084
484A	2.973	2.735	2.545	2.356	1.984	1.565	1.339	1.26	1.121	0.988	0.878
484B	3.012	2.776	2.575	2.403	2.016	1.577	1.362	1.292	1.13	1.008	0.914
C484	3.248	3.234	3.214	3.35	3.308	3.234	2.782	2.166	1.681	1.523	1.389
485A	0.668	0.645	0.63	0.612	0.576	0.515	0.388	0.322	0.252	0.207	0.171
485B	0.671	0.647	0.631	0.611	0.574	0.515	0.391	0.324	0.249	0.199	0.168
C485	0.676	0.666	0.655	0.644	0.633	0.606	0.508	0.407	0.29	0.239	0.2
486A	OVER	OVER	OVER	OVER	OVER	OVER	3.339	3.175	2.728	2.616	2.459
486B	OVER	OVER	OVER	OVER	OVER	OVER	3.31	3.152	2.731	2.592	2.456
C486	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.912	0.834	0.143
487A	0.69	0.669	0.647	0.626	0.58	0.509	0.384	0.325	0.265	0.218	0.178
487B	0.681	0.654	0.637	0.616	0.566	0.495	0.374	0.323	0.257	0.215	0.178
C487	0.714	0.7	0.688	0.675	0.65	0.61	0.5	0.406	0.301	0.247	0.208
488A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.373	2.771	2.661	2.517
488B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.345	2.828	2.668	2.524
C488	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.171	3.289	0.895
489A	0.361	0.351	0.347	0.34	0.327	0.307	0.278	0.255	0.197	0.131	0.093
489B	0.362	0.357	0.348	0.341	0.328	0.305	0.276	0.25	0.195	0.145	0.098
C489	0.36	0.357	0.356	0.354	0.352	0.348	0.344	0.341	0.327	0.263	0.177
490A	2.802	2.687	2.615	2.547	2.517	2.396	1.251	0.962	0.422	0.175	0.074
490B	2.8	2.748	2.624	2.566	2.533	2.393	1.195	0.916	0.401	0.163	0.072
C490	2.955	2.989	3.062	3.263	3.299	3.369	3.337	3.293	2.632	1.13	0.374
491A	0.381	0.371	0.376	0.357	0.344	0.297	0.264	0.26	0.224	0.132	0.117
491B	0.375	0.366	0.361	0.344	0.327	0.292	0.245	0.217	0.179	0.13	0.099
C491	0.378	0.381	0.373	0.363	0.352	0.331	0.288	0.26	0.203	0.195	0.179
492A	2.832	2.69	2.633	2.556	2.497	2.336	1.182	0.768	0.357	0.146	0.081
492B	2.897	2.707	2.624	2.556	2.517	2.353	1.135	0.82	0.361	0.184	0.088
C492	3	3.033	3.115	3.287	3.335	3.379	3.323	3.28	2.545	1.183	0.375
493A	0.711	0.701	0.694	0.68	0.662	0.634	0.58	0.546	0.456	0.322	0.255
493B	0.711	0.703	0.697	0.68	0.662	0.635	0.577	0.546	0.457	0.324	0.256
C493	0.719	0.717	0.713	0.713	0.711	0.707	0.699	0.692	0.655	0.567	0.418
494A	3.154	3.188	3.319	OVER	OVER	OVER	OVER	OVER	2.191	0.508	0.283
494B	3.202	3.221	3.365	OVER	OVER	OVER	OVER	OVER	2.154	0.535	0.3
C494	3.298	3.232	3.353	OVER	OVER	OVER	OVER	OVER	2.82	3.431	2.159
495A	0.73	0.717	0.708	0.685	0.653	0.611	0.515	0.467	0.42	0.315	0.252
495B	0.744	0.735	0.72	0.702	0.675	0.626	0.536	0.479	0.418	0.317	0.251
C495	0.743	0.728	0.727	0.72	0.709	0.709	0.651	0.646	0.56	0.469	0.37
496A	3.217	3.16	3.318	OVER	OVER	OVER	OVER	OVER	2.06	0.416	0.288
496B	3.192	3.142	3.293	OVER	OVER	OVER	OVER	OVER	2.157	0.512	0.322
C496	3.129	3.219	3.323	OVER	OVER	OVER	OVER	OVER	3.038	3.47	2.532
497A	0.366	0.36	0.352	0.344	0.341	0.336	0.334	0.332	0.332	0.339	0.338
497B	0.36	0.356	0.349	0.342	0.336	0.331	0.328	0.328	0.329	0.335	0.331
C497	0.365	0.366	0.363	0.363	0.359	0.357	0.357	0.356	0.355	0.351	0.349
498A	3.09	2.95	2.879	2.894	2.982	3.08	3.085	2.947	2.04	1.816	1.741
498B	3.049	2.909	2.851	2.858	2.933	3.027	3	2.882	1.986	1.797	1.714
C498	3.262	3.258	3.277	3.368	3.409	3.412	3.419	3.407	3.297	3.208	3.28
499A	0.376	0.369	0.361	0.348	0.336	0.315	0.281	0.262	0.242	0.302	0.285
499B	0.376	0.367	0.359	0.346	0.332	0.311	0.276	0.256	0.23	0.302	0.275
C499	0.387	0.384	0.382	0.375	0.366	0.35	0.331	0.312	0.291	0.326	0.313
500A	3.054	2.935	2.868	2.861	2.907	2.967	2.914	2.722	1.868	1.613	1.531
500B	3.028	2.925	2.856	2.864	2.881	2.936	2.836	2.615	1.828	1.605	1.496
C500	3.311	3.324	3.368	3.424	3.42	3.397	3.34	3.291	3.18	3.158	3.068
501A	0.716	0.712	0.701	0.694	0.688	0.685	0.682	0.681	0.682	0.685	0.682
501B	0.718	0.708	0.701	0.694	0.691	0.682	0.679	0.678	0.68	0.683	0.674
C501	0.729	0.733	0.728	0.725	0.726	0.719	0.724	0.722	0.721	0.716	0.711

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
502A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
502B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C502	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
503A	0.736	0.724	0.712	0.696	0.678	0.636	0.579	0.549	0.514	0.513	0.412
503B	0.73	0.717	0.704	0.689	0.673	0.638	0.601	0.598	0.559	0.611	0.591
C503	0.76	0.753	0.748	0.738	0.729	0.701	0.654	0.623	0.58	0.624	0.638
504A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.492
504B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C504	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
505A	0.357	0.349	0.345	0.335	0.333	0.328	0.324	0.324	0.323	0.325	0.33
505B	0.356	0.347	0.342	0.334	0.331	0.325	0.323	0.32	0.318	0.322	0.322
C505	0.359	0.357	0.355	0.353	0.35	0.345	0.342	0.342	0.337	0.331	0.328
506A	3.07	2.884	2.806	2.737	2.764	2.847	2.917	2.781	1.814	1.599	1.51
506B	3.02	2.843	2.764	2.697	2.705	2.771	2.858	2.778	1.888	1.614	1.488
C506	3.339	3.309	3.345	3.377	3.399	3.431	3.425	3.417	3.206	3.162	3.3
507A	0.374	0.365	0.356	0.346	0.336	0.315	0.289	0.27	0.251	0.306	0.358
507B	0.373	0.364	0.357	0.342	0.332	0.308	0.283	0.276	0.254	0.253	0.262
C507	0.377	0.373	0.366	0.356	0.347	0.323	0.292	0.314	0.254	0.23	0.239
508A	3.048	2.882	2.804	2.712	2.702	2.739	2.814	2.76	1.825	1.421	1.316
508B	3.058	2.875	2.81	2.711	2.699	2.734	2.783	2.75	1.994	1.439	1.296
C508	3.337	3.333	3.354	3.388	3.395	3.391	3.359	3.329	3.118	3.084	3.085
509A	0.695	0.686	0.68	0.672	0.665	0.655	0.647	0.65	0.644	0.642	0.64
509B	0.702	0.691	0.684	0.68	0.673	0.662	0.654	0.654	0.65	0.652	0.652
C509	0.713	0.712	0.708	0.705	0.699	0.698	0.699	0.697	0.695	0.689	0.689
510A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
510B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C510	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
511A	0.729	0.717	0.709	0.69	0.674	0.64	0.596	0.612	0.54	0.511	0.517
511B	0.726	0.714	0.703	0.681	0.67	0.627	0.58	0.61	0.538	0.51	0.528
C511	0.725	0.718	0.711	0.707	0.687	0.681	0.636	0.624	0.6	0.593	0.618
512A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
512B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C512	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
513A	0.368	0.364	0.364	0.363	0.359	0.356	0.352	0.351	0.343	0.299	0.282
513B	0.366	0.362	0.362	0.36	0.356	0.353	0.351	0.349	0.343	0.29	0.272
C513	0.369	0.37	0.369	0.37	0.369	0.368	0.366	0.366	0.364	0.365	0.362
514A	3.178	3.116	3.102	3.078	3.048	3.007	2.676	2.596	2.528	2.466	2.46
514B	3.213	3.164	3.142	3.108	3.101	3.048	2.725	2.675	2.562	2.504	2.497
C514	3.272	3.271	3.288	3.295	3.319	3.347	3.333	3.321	3.359	3.25	3.279
515A	0.4	0.393	0.391	0.385	0.373	0.353	0.325	0.297	0.245	0.219	0.196
515B	0.406	0.397	0.396	0.391	0.377	0.353	0.313	0.277	0.216	0.21	0.182
C515	0.414	0.411	0.41	0.406	0.399	0.382	0.359	0.35	0.315	0.326	0.309
516A	3.23	3.18	3.154	3.131	3.09	2.924	2.652	2.567	2.487	2.443	2.43
516B	3.219	3.162	3.133	3.113	3.091	2.93	2.654	2.566	2.475	2.431	2.428
C516	3.3	3.296	3.309	3.306	3.33	3.339	3.331	3.32	3.365	3.209	3.233
517A	0.737	0.733	0.731	0.728	0.724	0.723	0.72	0.718	0.708	0.657	0.637
517B	0.739	0.736	0.736	0.731	0.728	0.725	0.724	0.72	0.708	0.656	0.639
C517	0.748	0.747	0.746	0.746	0.746	0.744	0.743	0.742	0.74	0.743	0.74
518A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
518B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C518	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
519A	0.776	0.769	0.764	0.759	0.749	0.733	0.7	0.695	0.622	0.609	0.59
519B	0.771	0.763	0.757	0.752	0.741	0.723	0.682	0.652	0.594	0.586	0.567
C519	0.775	0.77	0.768	0.766	0.763	0.751	0.741	0.735	0.712	0.701	0.691
520A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
520B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C520	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
521A	0.322	0.316	0.309	0.306	0.303	0.295	0.284	0.277	0.247	0.096	0.039
521B	0.336	0.327	0.318	0.318	0.315	0.309	0.299	0.292	0.273	0.102	0.064
C521	0.323	0.314	0.311	0.307	0.304	0.297	0.286	0.281	0.251	0.088	0.048
522A	3.15	3.091	3.054	3.018	2.977	2.899	2.322	2.176	1.915	1.701	1.341
522B	3.144	3.097	3.06	3.026	2.979	2.897	2.312	2.17	1.912	1.659	1.287
C522	3.185	3.175	3.174	3.177	3.181	3.155	3.095	3.001	2.845	2.709	2.471
523A	0.377	0.364	0.358	0.35	0.338	0.314	0.261	0.228	0.136	0.061	0.047
523B	0.377	0.361	0.357	0.352	0.344	0.329	0.301	0.28	0.141	0.056	0.037
C523	0.386	0.375	0.369	0.363	0.352	0.325	0.288	0.232	0.128	0.058	0.045
524A	3.17	3.119	3.086	3.048	2.983	2.605	2.319	2.151	1.813	1.637	1.248
524B	3.182	3.129	3.101	3.045	2.972	2.543	2.192	2.021	1.665	1.373	0.982
C524	3.262	3.248	3.249	3.24	3.245	3.158	2.994	2.921	2.708	2.501	2.217
525A	0.671	0.663	0.656	0.65	0.64	0.627	0.609	0.592	0.458	0.257	0.155
525B	0.673	0.664	0.657	0.647	0.643	0.627	0.607	0.594	0.457	0.238	0.175
C525	0.672	0.666	0.657	0.655	0.65	0.634	0.615	0.61	0.455	0.292	0.213
526A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
526B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C526	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
527A	0.72	0.706	0.699	0.688	0.672	0.627	0.532	0.465	0.3	0.174	0.157
527B	0.73	0.717	0.708	0.697	0.68	0.644	0.544	0.473	0.367	0.196	0.171
C527	0.73	0.72	0.713	0.704	0.695	0.67	0.617	0.541	0.378	0.335	0.279
528A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.494
528B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.454
C528	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
529A	0.352	0.35	0.349	0.349	0.35	0.35	0.35	0.35	0.345	0.211	0.126
529B	0.348	0.346	0.345	0.345	0.343	0.343	0.35	0.358	0.372	0.382	0.384
C529	0.358	0.356	0.355	0.355	0.353	0.353	0.353	0.354	0.355	0.358	0.363
530A	3.151	3.085	3.052	3.015	2.999	2.991	2.978	2.817	2.693	2.605	2.541
530B	3.181	3.115	3.087	3.042	3.044	3.032	2.991	2.846	2.714	2.611	2.567
C530	0.3258	3.259	3.27	3.269	3.28	3.279	3.273	3.258	3.24	3.237	3.218

525nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
531A	0.386	0.38	0.377	0.374	0.37	0.363	0.355	0.35	0.286	0.196	0.15
531B	0.388	0.384	0.38	0.376	0.37	0.363	0.358	0.356	0.351	0.325	0.26
C531	0.392	0.388	0.384	0.383	0.379	0.372	0.363	0.36	0.344	0.336	0.33
532A	3.252	3.189	3.152	3.121	3.111	3.092	3.037	2.891	2.747	2.623	2.546
532B	3.239	3.173	3.147	3.104	3.064	3.071	3.07	3.029	2.788	2.678	2.6
C532	3.286	3.294	3.303	3.295	3.278	3.301	3.282	3.276	3.256	3.232	3.151
533A	0.711	0.707	0.705	0.702	0.699	0.695	0.698	0.7	0.706	0.71	0.714
533B	0.714	0.711	0.707	0.703	0.702	0.698	0.699	0.701	0.704	0.707	0.71
C533	0.706	0.705	0.704	0.702	0.701	0.702	0.697	0.695	0.695	0.667	0.611
534A	over	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
534B	over	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C534	over	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
535A	0.742	0.736	0.732	0.725	0.716	0.707	0.7	0.698	0.691	0.682	0.671
535B	0.737	0.735	0.73	0.724	0.715	0.705	0.699	0.699	0.696	0.679	0.658
C535	0.741	0.738	0.736	0.733	0.729	0.722	0.712	0.706	0.699	0.689	0.682
536A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
536B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C536	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
537A	0.36	0.358	0.356	0.351	0.341	0.329	0.313	0.307	0.306	0.307	0.304
537B	0.358	0.354	0.353	0.347	0.34	0.326	0.309	0.304	0.305	0.305	0.302
C537	0.362	0.361	0.36	0.361	0.361	0.36	0.358	0.358	0.357	0.356	0.354
538A	2.974	2.926	2.94	2.937	2.901	2.831	2.797	2.785	2.715	2.699	2.65
538B	2.969	2.919	2.921	2.914	2.876	2.817	2.781	2.765	2.7	2.692	2.616
C538	3.026	3.043	3.092	3.188	3.236	3.243	3.278	3.235	3.007	3.018	3.003
539A	0.394	0.389	0.386	0.381	0.371	0.352	0.327	0.315	0.309	0.303	0.293
539B	0.394	0.389	0.385	0.379	0.368	0.348	0.324	0.314	0.304	0.296	0.29
C539	0.401	0.399	0.398	0.396	0.393	0.388	0.38	0.375	0.361	0.356	0.349
540A	3.002	2.946	2.964	2.95	2.913	2.846	2.815	2.8	2.701	2.692	2.541
540B	2.987	2.958	2.972	2.961	2.93	2.863	2.818	2.801	2.708	2.721	2.536
C540	3.069	3.081	3.15	3.208	3.262	3.275	3.276	3.232	3.025	3.007	3.027
541A	0.719	0.715	0.708	0.7	0.687	0.672	0.661	0.659	0.657	0.655	0.655
541B	0.722	0.713	0.711	0.705	0.687	0.672	0.662	0.659	0.659	0.66	0.655
C541	0.723	0.722	0.723	0.722	0.721	0.72	0.72	0.719	0.719	0.714	0.716
542A	3.288	3.36	3.463	OVER	OVER	OVER	OVER	OVER	3.301	3.316	3.301
542B	3.305	3.34	3.473	OVER	OVER	OVER	OVER	OVER	3.32	3.308	3.31
C542	3.31	3.361	3.467	OVER	OVER	OVER	OVER	OVER	3.333	3.275	3.304
543A	0.764	0.756	0.752	0.741	0.722	0.696	0.675	0.665	0.647	0.65	0.644
543B	0.75	0.743	0.736	0.726	0.71	0.691	0.672	0.668	0.656	0.653	0.644
C543	0.752	0.749	0.75	0.747	0.745	0.739	0.728	0.723	0.71	0.71	0.71
544A	3.31	3.37	OVER	OVER	OVER	OVER	OVER	OVER	3.343	3.286	3.316
544B	3.345	3.368	OVER	OVER	OVER	OVER	OVER	OVER	3.367	3.312	3.333
C544	3.352	3.38	OVER	OVER	OVER	OVER	OVER	OVER	3.317	3.321	3.312
545A	0.363	0.36	0.357	0.353	0.345	0.331	0.314	0.306	0.292	0.282	0.273
545B	0.367	0.364	0.361	0.356	0.347	0.333	0.315	0.309	0.296	0.284	0.276
C545	0.369	0.368	0.368	0.367	0.365	0.364	0.359	0.358	0.356	0.35	0.348
546A	2.984	2.937	2.946	2.933	2.892	2.844	2.705	2.624	2.515	2.515	2.525
546B	2.961	2.918	2.922	2.899	2.861	2.805	2.662	2.597	2.481	2.477	2.487
C546	3.032	3.161	3.117	3.188	3.232	3.253	3.294	3.25	2.963	3.016	3.063
547A	0.378	0.374	0.372	0.365	0.353	0.334	0.309	0.3	0.278	0.27	0.254
547B	0.384	0.379	0.376	0.368	0.357	0.333	0.307	0.294	0.276	0.268	0.249
C547	0.388	0.387	0.386	0.382	0.376	0.365	0.349	0.34	0.329	0.332	0.324
548A	2.974	2.928	2.941	2.91	2.871	2.813	2.655	2.587	2.467	2.464	2.971
548B	2.962	2.936	2.927	2.906	2.857	2.803	2.64	2.58	2.481	2.435	2.438
C548	3.063	3.145	3.143	3.204	3.232	3.262	3.288	3.241	2.977	3.005	3.054
549A	0.719	0.714	0.71	0.704	0.689	0.674	0.664	0.657	0.641	0.628	0.621
549B	0.728	0.722	0.718	0.71	0.697	0.681	0.669	0.665	0.649	0.636	0.626
C549	0.726	0.725	0.725	0.725	0.724	0.721	0.718	0.716	0.713	0.712	0.709
550A	3.27	3.344	3.453	OVER	OVER	OVER	OVER	OVER	3.181	3.26	3.357
550B	3.285	3.36	3.48	OVER	OVER	OVER	OVER	OVER	3.192	3.272	3.365
C550	3.334	3.339	3.469	OVER	OVER	OVER	OVER	OVER	3.218	3.244	3.376
551A	0.742	0.734	0.728	0.718	0.702	0.679	0.654	0.644	0.616	0.61	0.599
551B	0.743	0.735	0.729	0.719	0.7	0.679	0.657	0.644	0.612	0.611	0.599
C551	0.751	0.751	0.749	0.746	0.741	0.733	0.722	0.717	0.71	0.699	0.693
552A	3.326	3.355	3.463	OVER	OVER	OVER	OVER	OVER	3.326	3.185	3.352
552B	3.276	3.341	3.481	OVER	OVER	OVER	OVER	OVER	3.228	3.214	3.368
C552	3.296	3.373	OVER	OVER	OVER	OVER	OVER	OVER	3.247	3.27	3.438
553A	0.343	0.334	0.327	0.32	0.302	0.286	0.255	0.231	0.195	0.177	0.172
553B	0.342	0.33	0.324	0.316	0.301	0.279	0.248	0.226	0.193	0.176	0.171
C553	0.344	0.337	0.332	0.326	0.317	0.306	0.289	0.274	0.247	0.194	0.179
554A	2.799	2.812	2.845	2.916	2.844	2.709	2.53	2.41	2.202	1.873	1.599
554B	2.804	2.819	2.912	2.936	2.873	2.743	2.56	2.434	2.232	1.911	1.628
C554	2.856	2.903	3.006	3.223	3.321	3.309	3.27	3.18	2.873	2.6	2.284
555A	0.383	0.373	0.366	0.355	0.334	0.308	0.269	0.241	0.201	0.187	0.174
555B	0.379	0.367	0.359	0.352	0.332	0.305	0.268	0.245	0.206	0.188	0.177
C555	0.384	0.374	0.369	0.363	0.349	0.332	0.306	0.289	0.243	0.198	0.184
556A	2.872	2.837	2.857	2.942	2.858	2.726	2.533	2.415	2.199	1.854	1.565
556B	2.787	2.829	2.841	2.938	2.867	2.725	2.542	2.414	2.2	1.884	1.586
C556	2.867	2.966	3.032	3.234	3.311	3.318	3.262	3.168	2.881	2.608	2.302
557A	0.701	0.686	0.679	0.666	0.64	0.608	0.565	0.527	0.465	0.365	0.343
557B	0.697	0.681	0.674	0.66	0.637	0.605	0.555	0.52	0.458	0.357	0.35
C557	0.697	0.688	0.687	0.68	0.663	0.648	0.625	0.599	0.552	0.447	0.366
558A	2.975	3.056	3.16	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
558B	3.017	3.123	3.151	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C558	3.017	3.094	3.209	OVER	OVER	OVER	OVER	OVER	3.477	OVER	OVER
559A	0.717	0.706	0.696	0.678	0.655	0.616	0.563	0.527	0.455	0.353	0.344
559B	0.734	0.717	0.708	0.698	0.66	0.626	0.567	0.533	0.461	0.369	0.354
C559	0.738	0.731	0.723	0.715	0.698	0.679	0.635	0.614	0.559	0.454	0.367

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
560A	2.985	3.07	3.226	OVER	OVER	OVER	OVER	OVER	3.498	OVER	OVER
560B	3.005	3.03	3.221	OVER	OVER	OVER	OVER	OVER	3.496	OVER	OVER
C560	2.989	3.046	3.265	OVER	OVER	OVER	OVER	OVER	3.475	OVER	OVER
561a	0.358	0.359	0.356	0.35	0.343	0.33	0.318	0.313	0.306	0.294	0.29
561B	0.366	0.365	0.358	0.355	0.347	0.336	0.327	0.315	0.308	0.292	0.294
C561	0.365	0.367	0.364	0.364	0.359	0.356	0.361	0.354	0.351	0.34	0.334
562A	3.051	2.998	2.946	2.978	2.913	2.819	2.739	2.698	2.647	2.603	2.56
562B	3.084	3.024	2.993	3.008	2.93	2.835	2.752	2.715	0.2652	2.616	2.575
C562	3.159	3.175	3.193	3.36	3.403	3.433	3.417	3.398	3.2	3.15	2.989
563A	0.383	0.379	0.377	0.372	0.36	0.344	0.325	0.319	0.301	0.285	0.279
563B	0.4	0.399	0.394	0.384	0.374	0.356	0.333	0.329	0.31	0.288	0.282
C563	0.391	0.391	0.388	0.385	0.381	0.372	0.361	0.36	0.348	0.332	0.319
564A	3.116	3.079	3.032	3.046	2.985	2.882	2.783	2.752	2.681	2.635	2.574
564B	3.084	3.068	2.995	3.001	2.954	2.859	2.75	2.715	2.661	2.598	2.527
C564	3.189	3.218	3.216	3.426	3.47	3.491	3.469	3.41	3.139	3.154	3.015
565A	0.724	0.721	0.717	0.705	0.694	0.683	0.667	0.659	0.652	0.638	0.63
565B	0.716	0.711	0.707	0.698	0.686	0.672	0.66	0.652	0.644	0.629	0.618
C565	0.714	0.716	0.715	0.714	0.71	0.709	0.704	0.701	0.697	0.686	0.68
566A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.427
566B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.358
C566	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.367
567A	0.771	0.758	0.753	0.743	0.731	0.7	0.677	0.662	0.656	0.611	0.599
567B	0.757	0.749	0.745	0.733	0.719	0.697	0.674	0.669	0.649	0.622	0.602
C567	0.754	0.751	0.748	0.744	0.74	0.729	0.718	0.716	0.706	0.686	0.669
568A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.482
568B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C568	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.447
569A	0.368	0.367	0.364	0.359	0.353	0.347	0.336	0.332	0.328	0.326	0.325
569B	0.362	0.359	0.356	0.353	0.349	0.339	0.331	0.327	0.324	0.322	0.321
C569	0.368	0.366	0.367	0.367	0.366	0.364	0.365	0.363	0.363	0.357	0.356
570A	3.263	3.18	3.128	3.067	3.032	2.95	1.942	2.921	2.869	2.918	2.92
570B	3.275	3.183	3.143	3.086	3.043	2.973	2.956	2.944	2.875	2.938	2.933
C570	3.381	3.378	3.424	3.464	3.494	OVER	OVER	OVER	3.36	3.42	3.408
571A	0.405	0.403	0.399	0.393	0.385	0.372	0.358	0.348	0.333	0.329	0.322
571B	0.397	0.391	0.39	0.382	0.373	0.362	0.344	0.336	0.326	0.321	0.314
C571	0.396	0.395	0.393	0.391	0.387	0.381	0.373	0.368	0.365	0.354	0.349
572A	3.258	3.171	3.107	3.058	2.996	2.933	2.924	2.901	2.83	2.839	2.819
572B	3.261	3.202	3.152	3.094	3.042	2.975	2.947	2.931	2.871	2.903	2.888
C572	3.499	3.445	OVER	OVER	OVER	OVER	OVER	OVER	3.348	3.454	3.429
573A	0.72	0.716	0.711	0.703	0.696	0.69	0.681	0.678	0.678	0.689	0.671
573B	0.716	0.712	0.708	0.702	0.695	0.684	0.679	0.676	0.675	0.672	0.671
C573	0.72	0.721	0.72	0.72	0.72	0.716	0.715	0.714	0.711	0.712	0.711
574A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
574B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C574	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
575A	0.766	0.758	0.753	0.744	0.728	0.711	0.687	0.681	0.677	0.66	0.65
575B	0.758	0.753	0.744	0.735	0.724	0.708	0.694	0.693	0.681	0.668	0.658
C575	0.767	0.764	0.761	0.757	0.754	0.749	0.736	0.735	0.724	0.713	0.705
576A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
576B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C576	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
577A	0.352	0.349	0.347	0.342	0.337	0.327	0.319	0.314	0.309	0.304	0.303
577B	0.352	0.348	0.347	0.34	0.336	0.326	0.317	0.363	0.307	0.303	0.301
C577	0.357	0.355	0.354	0.354	0.354	0.353	0.349	0.348	0.345	0.343	0.34
578A	3.124	3.066	3.008	2.933	2.879	2.814	2.791	2.757	2.742	2.743	2.741
578B	3.176	3.084	3.014	2.935	2.893	2.808	2.785	2.752	2.742	2.752	2.745
C578	3.253	3.245	3.281	3.303	3.344	3.338	3.35	3.342	3.312	3.345	3.368
579A	0.376	0.372	0.367	0.364	0.357	0.339	0.327	0.319	0.303	0.303	0.295
579B	0.377	0.372	0.368	0.362	0.356	0.34	0.325	0.32	0.305	0.297	0.29
C579	0.382	0.382	0.376	0.373	3.7	0.364	0.353	0.346	0.349	0.333	0.325
580A	3.155	3.072	3.016	2.94	2.878	2.793	2.757	2.738	2.702	2.705	2.683
580B	3.184	3.099	3.037	2.957	2.914	2.814	2.78	2.758	2.728	2.726	2.721
C580	3.332	3.314	3.348	3.361	3.399	3.402	3.407	3.393	3.331	3.337	3.373
581A	0.692	0.686	0.682	0.675	0.667	0.656	0.652	0.644	0.641	0.636	0.633
581B	0.702	0.695	0.691	0.683	0.678	0.664	0.656	0.654	0.649	0.644	0.642
C581	0.693	0.692	0.691	0.69	0.69	0.686	0.686	0.683	0.68	0.676	0.675
582A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
582B	OVER	OVER	oVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C582	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
583A	0.729	0.723	0.718	0.707	0.697	0.681	0.66	0.654	0.644	0.638	0.624
583B	0.734	0.721	0.72	0.71	0.697	0.678	0.654	0.651	0.648	0.633	0.618
C583	0.752	0.748	0.747	0.742	0.743	0.725	0.711	0.708	0.699	0.691	0.673
584A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
584B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C584	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER

Appendix III. Calculated Permanganate Depletion Rate Constants

301	-0.167			373	-0.030	447	-0.127
302				374		448	
303	-0.162	377	-0.078	375	-0.035	449	
304		378	-0.046	376		450	
305	-0.128	379	-0.096	451	-0.788	518	
306		380	-0.068	452		519	-0.062
307	-0.115	381	-0.057	453	-0.838	520	
308		382		454		521	
309	-0.147	383	-0.065	455	-0.655	522	-0.133
310		384		456		523	
311	-0.211	385	-0.083	457	-0.336	524	-0.118
312		386		458	-0.174	525	-0.397
313	-0.146	387	-0.087	459	-0.434	526	
314		388		460	-0.062	527	-0.412
315	-0.178	389	-0.162	461	-0.197	528	
316		390	-0.347	462		529	-0.117
317	-0.260	391	-0.182	463	-0.203	530	-0.046
318		392	-0.386	464		531	-0.146
319	-0.247	393		465	0.082	532	-0.044
320		394		466	-0.220	533	-0.072
321	-0.556	395		467	-0.038	534	
322		396		468		535	-0.088
323		397		469	-0.092	536	
324		398		470		537	-0.068
325	-0.166	399		471	-0.046	538	
326		400		472		539	0.045
327	-0.209	401	-0.191	473	-0.042	540	
328		402		474	-0.390	541	-0.047
329	-0.104	403	-0.219	475	-0.098	542	
330		404		476	-0.375	543	-0.074
331	-0.121	405	-0.137	477	-0.032	544	
332		406		478		545	-0.037
333	-0.133	407	-0.156	479	-0.082	546	-0.034
334	-0.124	408		480		547	-0.048
335	-0.155	409		481	-0.223	548	-0.035
336		410		482		549	-0.030
337	-0.086	411		483	-0.266	550	
338		412		484		551	-0.037
339	-0.107	413		485	-0.259	552	
340		414		486		553	-0.778
341	-0.461	415		487	-0.302	554	-0.058
342		416		488		555	
343	-0.474	417	-0.114	489	-0.080	556	-0.064
344		418		490	-0.283	557	-0.244
345	-0.329	419	-0.130	491	-0.121	558	
346		420		492	-0.278	559	-0.282
347	-0.303	421	-0.079	493	-0.082	560	
348		422		494		561	-0.117
349	-0.100	423	-0.090	495	-0.112	562	-0.080
350		424		496		563	-0.129
351	-0.114	425	-0.094	497	-0.134	564	-0.076
352		426		498	-0.191	565	-0.071
353	-0.588	427	-0.116	499	-0.213	566	
354	-0.226	428		500	-0.196	567	-0.087
355	-0.580	429	-0.064	501	-0.082	568	
356	-0.227	430		502		569	-0.074
357	-0.097	431	-0.072	503	-0.125	570	-0.072
358		432		504		571	-0.084
359	-0.120	433	-0.219	505	-0.128	572	-0.071
360		434		506	-0.184	573	-0.048
361	-0.066	435	-0.273	507	-0.196	574	
362		436		508	-0.188	575	-0.060
363	-0.076	437	-0.197	509	-0.082	576	
364		438		510		577	-0.125
365	-0.179	439	-0.223	511	-0.110	578	-0.094
366		440		512		579	-0.143
367	-0.185	441	-0.179	513	-0.086	580	-0.097
368		442	-0.192	514	-0.087	581	-0.079
369	-0.037	443	-0.287	515	-0.111	582	
370	-0.051	444	-0.181	516	-0.078	583	-0.090
371	-0.046	445	-0.089	517	-0.051	584	
372	-0.056	446					

ID	k_{obs} - permanganate depletion						
9	-0.108	82		155	-0.113	228	
10	-0.093	83		156		229	-0.210
11	-0.128	84		157	-0.293	230	
12		85	-0.512	158		231	-0.217
13	-0.133	86		159	-0.312	232	
14		87	-0.573	160		233	-0.102
15	-0.098	88		161	-0.254	234	
16		89		162		235	-0.115
17	-0.217	90		163	-0.283	236	
18	-0.065	91		164		237	-0.074
19	-0.161	92		165	-0.158	238	
20		93	-0.057	166	-0.130	239	-0.086
21	-0.271	94	-0.117	167	-0.181	240	
22	-0.133	95	-0.072	168	-0.142	241	-0.134
23	-0.159	96	-0.201	169		242	
24	-0.134	97	-0.037	170		243	-0.146
25	-0.070	98		171		244	
26		99	-0.048	172		245	-0.091
27	-0.089	100		173	-0.131	246	
28		101	-0.079	174		247	-0.096
29	-0.087	102	-0.231	175	-0.164	248	
30		103	-0.173	176		249	-0.281
31	-0.070	104	-0.232	177	-0.091	250	
32		105	-0.062	178		251	-0.303
33	-0.093	106		179	-0.108	252	
34		107	-0.106	180		253	-0.312
35	-0.080	108		181	-0.237	254	
36		109	-0.100	182		255	-0.338
37	-0.132	110		183	-0.244	256	
38		111	-0.118	184		257	-0.141
39	-0.071	112		185	-0.029	258	
40		113	-0.228	186	-0.053	259	-0.186
41		114		187	-0.038	260	-0.057
42		115	-0.398	188	-0.056	261	
43		116		189	-0.023	262	-0.560
44		117	-0.252	190		263	
45		118		191	-0.031	264	
46	-0.736	119	-0.280	192		265	
47		120		193	-0.059	266	
48	-0.363	121	-0.214	194	-0.120	267	
49	-1.177	122		195	-0.072	268	
50		123	-0.207	196	-0.126	269	
51		124		197	-0.043	270	
52		125	-0.072	198		271	
53		126		199	-0.053	272	
54		127	-0.091	200		273	
55		128		201	-0.060	274	
56	-0.249	129	-0.054	202	-0.163	275	
57		130		203	-0.069	276	
58		131	-0.063	204	-0.166	277	-0.035
59	-0.298	132		205	-0.129	278	-0.103
60		133	-0.372	206		279	-0.047
61		134		207	-0.147	280	-0.097
62		135	-0.371	208	-0.351	281	-0.024
63		136		209	-0.649	282	
64		137	-0.131	210		283	-0.034
65		138		211	-0.696	284	
66		139	-0.140	212		285	-0.056
67	-0.350	140		213	-0.291	286	-0.142
68		141	-0.127	214		287	-0.132
69		142		215	-0.297	288	-0.160
70		143	-0.166	216		289	-0.042
71	-0.264	144		217	-0.109	290	
72		145	-0.081	218		291	-0.074
73	-0.209	146		219	-0.111	292	
74		147	-0.106	220		293	-0.105
75	-0.273	148		221	-0.086	294	-0.218
76		149	-0.116	222		295	-0.130
77		150		223	-0.087	296	-0.245
78		151	-0.156	224		297	-0.246
79		152		225		298	-0.420
80		153	-0.075	226		299	-0.393
81		154		227		300	-0.441

Appendix IV. 418 nm Spectrophotometric Study Data

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
9A	0.021	0.031	0.049	0.082	0.132	0.159	0.174	0.178	0.13	0.083	0.076
9B	0.019	0.029	0.046	0.079	0.13	0.155	0.163	0.172	0.145	0.082	0.081
C9	0.016	0.017	0.019	0.019	0.026	0.038	0.055	0.059	0.061	0.053	0.049
10A	0.847	1.139	1.22	1.257	1.267	1.252	0.825	0.505	0.302	0.26	0.141
10B	0.859	1.141	1.212	1.239	1.238	1.125	0.653	0.481	0.28	0.218	0.22
C10	0.046	0.05	0.051	0.053	0.062	0.07	0.072	0.072	0.072	0.067	0.064
11A	0.031	0.052	0.073	0.094	0.135	0.182	0.212	0.208	0.15	0.083	0.082
11B	0.066	0.106	0.116	0.136	0.18	0.214	0.248	0.286	0.243	0.106	0.155
C11	0.022	0.026	0.027	0.028	0.03	0.035	0.038	0.039	0.045	0.045	0.043
12A	0.927	1.268	1.322	1.35	1.337	1.168	0.574	0.565	0.415	0.182	0.212
12B	1.417	1.152	1.258	1.299	1.266	1.257	0.765	0.467	0.366	0.394	0.377
C12	0.107	0.055	0.055	0.056	0.059	0.062	0.065	0.065	0.066	0.072	0.066
13A	0.023	0.04	0.06	0.109	0.147	0.181	0.193	0.201	0.155	0.111	0.091
13B	0.021	0.036	0.058	0.101	0.148	0.176	0.193	0.194	0.132	0.086	0.073
C13	0.015	0.017	0.018	0.019	0.021	0.027	0.036	0.043	0.05	0.044	0.037
14A	0.851	1.084	1.15	1.172	1.157	1.114	0.645	0.451	0.375	0.365	0.196
14B	0.905	1.137	1.198	1.248	1.197	1.173	0.61	0.479	0.354	0.31	0.284
C14	0.049	0.055	0.06	0.067	0.076	0.081	0.081	0.082	0.079	0.076	0.067
15A	0.029	0.041	0.052	0.067	0.104	0.151	0.173	0.186	0.173	0.115	0.097
15B	0.03	0.042	0.055	0.07	0.108	0.153	0.184	0.179	0.16	0.103	0.091
C15	0.02	0.022	0.023	0.024	0.025	0.028	0.029	0.032	0.034	0.034	0.032
16A	0.872	1.049	1.104	1.152	1.144	1.095	0.742	0.566	0.283	0.214	0.192
16B	0.83	1.009	1.065	1.114	1.102	0.99	0.565	0.469	0.397	0.366	0.36
C16	0.06	0.061	0.062	0.063	0.065	0.068	0.071	0.072	0.076	0.074	0.074
17A	0.051	0.06	0.088	0.139	0.193	0.216	0.205	0.18	0.103	0.039	0.025
17B	0.06	0.069	0.087	0.141	0.195	0.212	0.195	0.162	0.098	0.042	0.027
C17	0.057	0.06	0.064	0.069	0.086	0.122	0.11	0.093	0.075	0.045	0.035
18A	0.682	0.902	0.962	0.975	0.932	0.811	0.542	0.341	0.116	0.093	0.099
18B	0.671	0.891	0.955	0.971	0.925	0.789	0.517	0.324	0.119	0.103	0.106
C18	0.072	0.084	0.103	0.134	0.146	0.149	0.14	0.132	0.11	0.075	0.07
19A	0.094	0.103	0.115	0.133	0.167	0.202	0.222	0.19	0.093	0.042	0.038
19B	0.087	0.101	0.114	0.135	0.171	0.216	0.226	0.228	0.115	0.052	0.044
C19	0.069	0.07	0.069	0.07	0.072	0.073	0.068	0.056	0.037	0.026	0.021
20A	0.765	1.083	1.175	1.183	1.124	0.954	0.577	0.367	0.199	0.168	0.139
20B	0.745	1.058	1.153	1.168	1.114	1.008	0.607	0.388	0.189	0.168	0.152
C20	0.09	0.093	0.094	0.095	0.096	0.094	0.091	0.087	0.069	0.059	0.059
21A	0.057	0.068	0.094	0.168	0.213	0.234	0.222	0.209	0.11	0.066	0.206
21B	0.055	0.069	0.098	0.176	0.22	0.242	0.232	0.193	0.117	0.05	0.036
C21	0.057	0.058	0.061	0.064	0.07	0.092	0.097	0.082	0.06	0.04	0.027
22A	0.893	1.086	1.144	1.149	1.096	0.957	0.504	0.32	0.161	0.14	0.143
22B	0.86	1.052	1.109	1.116	1.064	0.94	0.511	0.315	0.166	0.142	0.146
C22	0.081	0.097	0.13	0.155	0.162	0.16	0.147	0.132	0.107	0.091	0.088
23A	0.084	0.093	0.107	0.125	0.162	0.202	0.213	0.211	0.094	0.052	0.039
23B	0.089	0.099	0.11	0.128	0.161	0.197	0.213	0.195	0.091	0.041	0.036
C23	0.078	0.078	0.079	0.079	0.078	0.073	0.064	0.057	0.033	0.025	0.023
24A	0.775	0.97	1.053	1.076	1.033	0.837	0.493	0.327	0.181	0.166	0.159
24B	0.789	0.981	1.067	1.098	1.063	0.878	0.516	0.34	0.175	0.157	0.157
C24	0.096	0.099	0.101	0.102	0.104	0.102	0.097	0.093	0.074	0.062	0.062
25A	0.044	0.08	0.136	0.183	0.214	0.236	0.24	0.238	0.198	0.058	0.045
25B	0.037	0.073	0.131	0.179	0.211	0.231	0.235	0.233	0.182	0.053	0.033
C25	0.032	0.034	0.034	0.038	0.04	0.046	0.054	0.058	0.161	0.061	0.051
26A	1.162	1.503	1.501	1.453	1.369	1.04	0.556	0.359	0.198	0.169	0.164
26B	1.198	1.501	1.505	1.447	1.365	1.103	0.569	0.379	0.223	0.205	0.174
C26	0.095	0.099	0.104	0.113	0.12	0.125	0.126	0.128	0.128	0.124	0.107
27A	0.057	0.088	0.115	0.161	0.211	0.255	0.269	0.268	0.212	0.075	0.049
27B	0.062	0.097	0.124	0.172	0.222	0.259	0.271	0.274	0.211	0.069	0.041
C27	0.033	0.038	0.039	0.041	0.042	0.045	0.047	0.048	0.05	0.055	0.054
28A	1.351	1.753	1.698	1.552	1.43	1.202	0.583	0.368	0.205	0.185	0.191
28B	1.134	1.626	1.601	1.483	1.385	1.181	0.578	0.381	0.243	0.21	0.213
C28	0.092	0.095	0.095	0.097	0.098	0.1	0.102	0.104	0.106	0.113	0.109
29A	0.047	0.086	0.153	0.202	0.237	0.257	0.259	0.256	0.183	0.062	0.042
29B	0.048	0.096	0.156	0.204	0.235	0.254	0.258	0.253	0.176	0.051	0.031
C29	0.029	0.031	0.031	0.032	0.035	0.039	0.046	0.051	0.054	0.056	0.047
30A	1.289	1.498	1.523	1.493	1.38	0.953	0.504	0.305	0.211	0.18	0.178
30B	1.38	1.541	1.559	1.525	1.411	0.955	0.5	0.361	0.206	0.188	0.176
C30	0.092	0.105	0.118	0.129	0.132	0.135	0.136	0.138	0.138	0.122	0.104
31A	0.048	0.073	0.097	0.139	0.188	0.231	0.248	0.252	0.199	0.054	0.046
31B	0.049	0.073	0.096	0.136	0.187	0.226	0.246	0.25	0.196	0.059	0.043
C31	0.049	0.055	0.058	0.052	0.055	0.056	0.058	0.073	0.062	0.062	0.069
32A	1.04	1.283	1.331	1.31	1.225	1.084	0.552	0.373	0.238	0.219	0.208
32B	1.175	1.338	1.372	1.356	1.279	1.12	0.539	0.364	0.232	0.21	0.211
C32	0.099	0.102	0.102	0.104	0.105	0.105	0.108	0.109	0.107	0.111	0.111
33A	0.066	0.08	0.111	0.19	0.221	0.235	0.208	0.186	0.11	0.049	0.041
33B	0.064	0.079	0.11	0.186	0.217	0.234	0.211	0.175	0.115	0.049	0.032
C33	0.048	0.051	0.053	0.06	0.074	0.114	0.111	0.105	0.106	0.064	0.047
34A	0.897	1.07	1.081	1.048	0.989	0.885	0.564	0.386	0.169	0.127	0.14
34B	0.921	1.088	1.097	1.067	0.995	0.862	0.597	0.424	0.192	0.154	0.155
C34	0.119	0.138	0.163	0.183	0.192	0.193	0.183	0.172	0.158	0.128	0.13
35A	0.099	0.122	0.136	0.167	0.206	0.249	0.249	0.227	0.162	0.095	0.073
35B	0.095	0.112	0.13	0.162	0.207	0.253	0.252	0.219	0.105	0.058	0.042
C35	0.068	0.069	0.07	0.072	0.074	0.076	0.071	0.066	0.05	0.033	0.028
36A	1.089	1.345	1.354	1.284	1.182	1.025	0.617	0.413	0.198	0.177	0.173
36B	1.106	1.356	1.363	1.296	1.203	1.052	0.618	0.408	0.222	0.176	0.183
C36	0.131	0.135	0.136	0.138	0.14	0.143	0.139	0.137	0.115	0.107	0.109
37A	0.072	0.11	0.189	0.239	0.273	0.286	0.255	0.22	0.12	0.06	0.056
37B	0.074	0.108	0.176	0.234	0.272	0.287	0.252	0.207	0.103	0.05	0.046
C37	0.073	0.076	0.079	0.083	0.104	0.137	0.13	0.114	0.091	0.064	0.056

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
38A	1.121	1.283	1.283	1.25	1.169	0.968	0.53	0.345	0.176	0.148	0.161
38B	1.173	1.285	1.296	1.266	1.174	0.99	0.544	0.377	0.182	0.166	0.168
C38	0.124	0.143	0.167	0.189	0.196	0.196	0.185	0.177	0.155	0.126	0.121
39A	0.095	0.11	0.126	0.154	0.195	0.235	0.225	0.213	0.099	0.054	0.037
39B	0.086	0.102	0.119	0.149	0.19	0.233	0.238	0.22	0.118	0.06	0.047
C39	0.061	0.062	0.062	0.063	0.063	0.064	0.062	0.055	0.051	0.036	0.029
40A	1.099	1.224	1.241	1.209	1.135	1.027	0.565	0.405	0.21	0.194	0.201
40B	1.088	1.209	1.234	1.21	1.15	1.022	0.557	0.399	0.216	0.192	0.202
C40	0.135	0.137	0.135	0.135	0.136	0.139	0.139	0.139	0.133	0.117	0.113
41A	0.042	0.044	0.044	0.04	0.039	0.022	0.013	0.013	0.016	0.016	0.018
41B	0.03	0.029	0.029	0.027	0.024	0.01	0.006	0.007	0.008	0.01	0.01
C41	0.033	0.034	0.036	0.046	0.03	0.017	0.013	0.016	0.014	0.022	0.022
42A	2.908	OVER	OVER	OVER	OVER	3.453	0.907	0.682	0.224	0.047	0.025
42B	3.452	OVER	OVER	OVER	OVER	2.372	1.144	0.727	0.25	0.053	0.03
C42	0.517	1.324	1.676	2.23	2.866	OVER	OVER	OVER	2.456	1.009	0.51
43A	0.2	0.403	0.458	0.536	0.625	0.715	0.781	0.77	0.269	0.126	0.071
43B	0.209	0.404	0.46	0.539	0.63	0.718	0.785	0.792	0.269	0.124	0.068
C43	0.163	0.364	0.414	0.482	0.555	0.628	0.699	0.725	0.301	0.128	0.066
44A	2.802	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.214	0.488	0.236
44B	2.61	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.436	0.52	0.248
C44	0.345	0.604	0.671	0.773	0.819	0.997	1.096	0.634	0.424	0.388	0.382
45A	0.046	0.051	0.048	0.046	0.045	0.024	0.016	0.015	0.015	0.015	0.016
45B	0.038	0.038	0.039	0.037	0.036	0.017	0.008	0.007	0.008	0.01	0.011
C45	0.029	0.03	0.03	0.027	0.026	0.011	0.007	0.008	0.009	0.011	0.013
46A	2.05	2.556	2.754	2.966	1.83	1.326	0.601	0.39	0.2	0.094	0.034
46B	1.976	2.496	2.694	2.899	1.871	1.023	0.599	0.411	0.202	0.086	0.026
C46	0.715	1.285	1.504	1.903	2.316	2.338	0.98	0.656	0.232	0.151	0.086
47A	0.212	0.366	0.417	0.496	0.588	0.692	0.821	0.815	0.224	0.082	0.046
47B	0.213	0.362	0.412	0.488	0.579	0.671	0.744	0.75	0.214	0.078	0.042
C47	0.198	0.343	0.388	0.456	0.534	0.619	0.693	0.711	0.255	0.081	0.051
48A	1.841	2.489	2.729	2.999	2.448	1.394	0.756	0.418	0.172	0.063	0.032
48B	1.804	2.444	2.704	3.006	2.342	1.28	0.9	0.395	0.165	0.07	0.055
C48	0.338	0.571	0.652	0.791	0.959	1.183	1.421	1.596	1.91	1.16	1.304
49A	0.077	0.076	0.076	0.075	0.071	0.051	0.036	0.032	0.029	0.025	0.028
49B	0.078	0.079	0.081	0.079	0.076	0.053	0.036	0.032	0.028	0.024	0.024
C49	0.088	0.087	0.085	0.084	0.081	0.063	0.046	0.044	0.041	0.038	0.034
50A	1.186	2.662	OVER	OVER	OVER	OVER	OVER	2.072	0.672	0.236	0.111
50B	1.373	2.926	OVER	OVER	OVER	OVER	2.792	1.73	0.88	0.346	0.219
C50	0.328	1.39	1.996	2.53	3.241	OVER	OVER	3.29	2.033	0.945	0.45
51A	0.265	0.427	0.507	0.572	0.651	0.679	0.535	0.412	0.219	0.105	0.069
51B	0.27	0.431	0.522	0.577	0.655	0.68	0.535	0.386	0.209	0.105	0.071
C51	0.276	0.419	0.492	0.55	0.618	0.639	0.479	0.367	0.221	0.094	0.06
52A	1.947	3.37	OVER	OVER	OVER	OVER	OVER	2.619	1.51	0.751	0.612
52B	2.007	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.448	1.081	1.228
C52	0.445	0.637	0.74	0.826	0.919	0.851	0.54	0.489	1.453	0.393	0.384
53A	0.071	0.07	0.069	0.068	0.064	0.045	0.034	0.031	0.028	0.024	0.026
53B	0.092	0.094	0.097	0.096	0.089	0.063	0.05	0.046	0.041	0.034	0.035
C53	0.092	0.092	0.092	0.09	0.085	0.065	0.054	0.048	0.049	0.044	0.043
54A	1.891	2.331	2.599	2.709	2.21	0.977	0.471	0.562	0.465	0.172	0.125
54B	1.843	2.215	2.465	2.573	2.308	0.992	0.502	0.492	0.275	0.132	0.118
C54	0.852	1.186	1.531	1.86	2.081	1.171	1.246	0.767	0.567	0.481	0.301
55A	0.281	0.373	0.45	0.504	0.58	0.635	0.466	0.357	0.224	0.101	0.091
55B	0.32	0.417	0.488	0.539	0.612	0.595	0.395	0.312	0.2	0.108	0.073
C55	0.288	0.385	0.441	0.494	0.559	0.557	0.413	0.318	0.227	0.111	0.076
56A	1.823	2.313	2.629	2.787	2.512	1.291	0.782	0.55	0.276	0.16	0.144
56B	1.849	2.273	2.566	2.717	2.384	1.173	0.86	0.526	0.24	0.268	0.151
C56	0.398	0.495	0.583	0.665	0.787	0.946	1.136	1.309	1.87	2.461	2.517
57A	0.057	0.101	0.184	0.637	1.671	1.274	0.514	0.386	0.147	0.024	0.01
57B	0.06	0.104	0.19	0.668	1.63	1.19	0.514	0.368	0.154	0.027	0.01
C57	0.047	0.073	0.12	0.381	1.579	1.282	0.63	0.448	0.166	0.033	0.01
58A	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.368	1.329	0.663
58B	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.147	1.242	0.574
C58	1.232	1.977	2.391	2.873	OVER	OVER	OVER	OVER	2.144	0.964	0.507
59A	0.379	0.505	0.568	0.651	0.781	0.868	0.938	0.82	0.403	0.198	0.084
59B	0.383	0.512	0.578	0.664	0.803	0.885	0.958	0.789	0.383	0.161	0.085
C59	0.361	0.46	0.51	0.575	0.672	0.697	0.634	0.515	0.379	0.3	0.199
60A	OVER	OVER	OVER	OVER	OVER	OVER	2.832	2.393	1.621	1.451	1.143
60B	OVER	OVER	OVER	OVER	OVER	OVER	3.248	2.526	1.883	1.669	1.258
C60	0.57	0.7	0.768	0.85	0.942	0.658	0.563	0.581	0.544	0.611	0.557
61A	0.077	0.14	0.273	0.988	1.667	1.052	0.439	0.355	0.155	0.036	0.009
61B	0.078	0.141	0.275	0.996	1.695	0.896	0.438	0.35	0.144	0.034	0.01
C61	0.053	0.086	0.158	0.616	1.652	1.192	0.51	0.38	0.16	0.04	0.009
62A	2.847	3.376	OVER	OVER	1.661	0.972	0.496	0.422	0.306	0.22	0.051
62B	2.984	OVER	OVER	OVER	1.739	0.967	0.572	0.434	0.283	0.246	0.082
C62	1.238	1.666	1.94	2.242	2.257	1.197	1.03	0.955	1.019	1.176	0.956
63A	0.386	0.466	0.527	0.611	0.743	1.734	0.514	0.496	0.293	0.115	0.057
63B	0.387	0.473	0.531	0.614	0.739	0.764	0.579	0.526	0.256	0.112	0.059
C63	0.367	0.431	0.478	0.542	0.633	0.625	0.473	0.429	0.313	0.223	0.172
64A	2.761	3.27	OVER	OVER	1.949	1.447	1.429	1.37	1.288	1.259	0.848
64B	2.871	3.482	OVER	OVER	2.042	1.652	1.568	1.503	1.365	1.321	0.875
C64	0.549	0.65	0.717	0.81	0.991	1.18	1.526	1.721	2.566	OVER	2.945
65A	0.102	0.139	0.231	0.853	1.69	1.534	0.736	0.412	0.116	0.029	0.019
65B	0.088	0.111	0.178	0.707	1.633	1.43	0.825	0.429	0.147	0.035	0.016
C65	0.085	0.106	0.155	0.561	1.772	1.568	0.649	0.393	0.113	0.028	0.016
66A	2.422	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.902	1.258	2.095
66B	2.409	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.703	2.525	OVER
C66	0.327	1.818	2.453	3.162	OVER	OVER	2.639	2.053	1.181	1.111	0.987

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
67A	0.321	0.524	0.6	0.692	0.797	0.82	0.647	0.517	0.356	0.208	0.151
67B	0.307	0.518	0.595	0.688	0.805	0.89	0.671	0.586	0.393	0.23	0.172
C67	0.284	0.479	0.543	0.621	0.707	0.724	0.548	0.439	0.332	0.241	0.217
68A	2.736	OVER	OVER	OVER	OVER	OVER	2.016	1.847	1.565	1.163	1.026
68B	2.762	OVER	OVER	OVER	OVER	OVER	1.577	1.457	1.261	1.05	0.952
C68	0.501	0.752	0.832	0.924	1.021	0.927	0.645	0.654	0.603	0.595	0.591
69A	0.12	0.182	0.304	1.21	1.713	1.204	0.507	0.305	0.099	0.027	0.025
69B	0.115	0.201	0.403	1.406	1.697	1.199	0.585	0.341	0.106	0.025	0.018
C69	0.099	0.142	0.234	1.014	1.76	1.557	0.654	0.417	0.094	0.025	0.021
70A	2.144	2.767	2.96	3.041	2.196	1.244	0.774	1.29	0.644	0.695	0.526
70B	2.074	2.6	2.773	2.822	2.347	1.246	0.753	0.636	0.56	0.397	0.321
C70	0.811	1.39	1.756	2.158	2.238	1.457	1.208	1.216	1.029	0.764	1.045
71A	0.307	0.487	0.556	0.65	0.766	0.848	0.535	0.417	0.298	0.156	0.1
71B	0.388	0.546	0.624	0.722	0.82	0.792	0.552	0.467	0.284	0.143	0.1
C71	0.292	0.451	0.517	0.582	0.67	0.743	0.457	0.365	0.265	0.236	0.192
72A	2.15	2.938	3.145	3.159	2.532	1.698	1.551	1.507	1.367	1.642	1.528
72B	1.998	2.718	2.953	2.958	2.666	1.876	1.663	1.634	1.734	1.575	1.295
C72	0.479	0.658	0.745	0.856	1.021	1.255	1.581	1.874	2.775	3.383	3.346
73A	0.04	0.061	0.099	0.16	0.209	0.247	0.264	0.259	0.142	0.052	0.042
73B	0.039	0.062	0.103	0.161	0.21	0.249	0.261	0.26	0.118	0.049	0.043
C73	0.037	0.037	0.046	0.056	0.079	0.084	0.088	0.089	0.082	0.048	0.037
74A	0.896	1.198	1.241	1.266	1.232	1.132	0.514	0.275	0.14	0.093	0.095
74B	0.908	1.215	1.252	1.283	1.253	1.153	0.531	0.303	0.128	0.099	0.101
C74	0.057	0.076	0.095	0.106	0.108	0.114	0.121	0.121	0.11	0.078	0.087
75A	0.049	0.075	0.118	0.188	0.232	0.261	0.238	0.216	0.077	0.041	0.039
75B	0.052	0.077	0.123	0.189	0.236	0.262	0.243	0.216	0.079	0.04	0.039
C75	0.05	0.053	0.062	0.074	0.112	0.117	0.114	0.111	0.073	0.045	0.03
76A	0.971	1.212	1.255	1.261	1.215	1.003	0.502	0.288	0.129	0.115	0.118
76B	0.964	1.212	1.251	1.259	1.196	1.056	0.515	0.288	0.135	0.113	0.114
C76	0.069	0.114	0.132	0.137	0.143	0.148	0.142	0.143	0.096	0.076	0.077
77A	0.033	0.026	0.029	0.028	0.025	0.011	0.007	0.007	0.007	0.009	0.011
77B	0.036	0.029	0.032	0.031	0.027	0.025	0.022	0.013	0.013	0.013	0.014
C77	0.036	0.032	0.036	0.032	0.031	0.013	0.012	0.015	0.012	0.015	0.016
78A	2.081	OVER	OVER	OVER	OVER	OVER	1.356	0.773	0.301	0.074	0.016
78B	2.104	OVER	OVER	OVER	OVER	OVER	1.421	0.814	0.202	0.078	0.019
C78	0.554	1.654	1.953	2.535	3.307	OVER	OVER	OVER	OVER	2.207	1.606
79A	0.078	0.074	0.08	0.081	0.079	0.056	0.035	0.028	0.027	0.028	0.027
79B	0.078	0.082	0.092	0.097	0.098	0.066	0.039	0.03	0.031	0.037	0.033
C79	0.068	0.06	0.063	0.062	0.058	0.044	0.035	0.032	0.029	0.022	0.022
80A	2.534	OVER	OVER	OVER	OVER	2.783	1.637	1.774	2.815	2.621	2.366
80B	2.702	OVER	OVER	OVER	OVER	3.031	2.589	OVER	3.227	2.857	2.921
C80	0.49	1.75	2.061	2.606	3.246	OVER	OVER	OVER	1.92	1.004	0.554
81A	0.059	0.092	0.123	0.302	0.697	0.848	0.857	0.698	0.386	0.092	0.029
81B	0.052	0.083	0.121	0.34	0.847	1.01	0.904	0.633	0.204	0.032	0.01
C81	0.049	0.062	0.077	0.164	0.719	0.881	0.91	0.754	0.38	0.088	0.021
82A	1.053	2.887	OVER	OVER	OVER	3.262	1.782	3.071	0.257	0.29	0.026
82B	1.061	2.811	OVER	OVER	OVER	3.247	2.161	0.336	0.352	0.191	0.042
C82	0.138	0.317	0.41	0.59	0.91	1.468	1.725	0.892	1.429	1.111	0.57
83A	0.106	0.132	0.159	0.291	0.927	0.992	0.819	0.629	0.328	0.166	0.073
83B	0.1	0.131	0.162	0.304	0.864	0.947	0.843	0.714	0.405	0.165	0.051
C83	0.09	0.106	0.115	0.164	0.717	0.979	0.904	0.782	0.46	0.176	0.045
84A	0.974	2.481	3.059	OVER	OVER	2.743	1.545	0.911	0.536	0.332	0.373
84B	0.95	2.233	2.642	OVER	OVER	1.98	1.24	0.756	0.514	0.425	0.297
C84	0.132	0.361	0.465	0.646	0.979	1.437	1.127	0.872	1.163	1.133	0.853
85A	0.08	0.187	0.372	0.707	0.996	1.389	1.617	0.705	0.352	0.071	0.014
85B	0.076	0.189	0.376	0.703	0.995	1.387	1.605	0.684	0.308	0.057	0.009
C85	0.066	0.116	0.196	0.476	0.688	0.972	1.252	0.983	0.387	0.1	0.014
86A	1.974	OVER	OVER	OVER	OVER	1.81	1.273	1.383	1.234	0.802	0.425
86B	2.026	OVER	OVER	OVER	OVER	1.677	1.279	1.493	1.278	0.678	0.441
C86	0.263	0.423	0.528	0.741	1.117	1.748	1.517	1.28	1.267	0.944	1.182
87A	0.11	0.18	0.312	0.675	0.985	1.32	1.055	0.518	0.229	0.045	0.013
87B	0.114	0.19	0.338	0.679	0.976	1.288	0.9	0.491	0.265	0.068	0.016
C87	0.122	0.164	0.226	0.537	0.786	1.007	1.136	0.758	0.377	0.126	0.042
88A	1.744	3.312	OVER	OVER	OVER	2.223	1.371	1.048	1.142	0.988	0.607
88B	1.773	3.294	OVER	OVER	OVER	2.115	1.359	1.035	1.106	0.923	0.58
C88	0.287	0.473	0.584	0.802	1.183	1.488	1.118	1.11	0.98	0.994	1.112
89A	0.056	0.102	0.174	0.464	0.721	0.894	0.866	0.693	0.294	0.082	0.028
89B	0.053	0.102	0.183	0.502	0.809	0.978	0.88	0.667	0.195	0.047	0.017
C89	0.047	0.064	0.083	0.156	0.606	0.774	0.876	0.722	0.383	0.111	0.046
90A	1.47	OVER	OVER	OVER	OVER	OVER	2.998	0.379	0.177	0.061	0.022
90B	1.523	OVER	OVER	OVER	OVER	OVER	OVER	0.312	0.159	0.029	0.01
C90	0.11	0.28	0.385	0.529	0.745	1.217	1.717	0.944	1.511	1.104	0.713
91A	0.083	0.115	0.157	0.331	0.823	0.986	0.754	0.5	0.195	0.051	0.034
91B	0.109	0.146	0.195	0.382	0.842	0.992	0.734	0.506	0.227	0.074	0.041
C91	0.096	0.114	0.13	0.185	0.609	0.93	0.834	0.683	0.445	0.204	0.106
92A	1.37	3.37	OVER	OVER	OVER	2.03	1.288	1.205	0.744	0.54	0.332
92B	1.312	2.886	OVER	OVER	OVER	1.862	1.013	0.785	0.315	0.426	0.371
C92	0.12	0.316	0.425	0.582	0.809	1.231	1.125	0.745	1.24	1.081	0.891
93A	0.037	0.037	0.037	0.039	0.036	0.038	0.037	0.035	0.031	0.033	0.035
93B	0.039	0.038	0.038	0.037	0.038	0.038	0.036	0.036	0.031	0.032	0.034
C93	0.042	0.039	0.039	0.038	0.036	0.037	0.035	0.034	0.033	0.029	0.029
94A	0.062	0.072	0.065	0.044	0.055	0.216	1.09	1.435	2.086	2.552	2.619
94B	0.063	0.071	0.062	0.042	0.057	0.249	1.154	1.551	2.213	2.684	2.675
C94	0.052	0.05	0.05	0.051	0.049	0.051	0.048	0.046	0.045	0.044	0.045
95A	0.089	0.087	0.087	0.085	0.085	0.08	0.074	0.067	0.056	0.048	0.044
95B	0.096	0.096	0.095	0.094	0.092	0.087	0.081	0.073	0.064	0.058	0.053
C95	0.124	0.121	0.118	0.118	0.113	0.108	0.1	0.094	0.081	0.067	0.06

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
96A	0.12	0.123	0.106	0.092	0.117	0.944	2.116	2.616	3.418	OVER	3.159
96B	0.108	0.116	0.099	0.081	0.108	0.955	2.146	2.677	3.426	OVER	3.128
C96	0.11	0.106	0.106	0.105	0.103	0.099	0.094	0.091	0.032	0.072	0.067
97A	0.035	0.035	0.036	0.036	0.037	0.039	0.036	0.036	0.037	0.037	0.037
97B	0.035	0.034	0.037	0.037	0.038	0.038	0.036	0.036	0.036	0.037	0.036
C97	0.038	0.037	0.036	0.036	0.036	0.035	0.034	0.032	0.032	0.029	0.028
98A	0.116	0.115	0.091	0.091	0.195	0.897	1.596	1.727	2.108	2.372	2.432
98B	0.118	0.117	0.094	0.096	0.214	1.075	1.689	1.742	2.123	2.414	2.471
C98	0.088	0.088	0.089	0.09	0.088	0.089	0.088	0.087	0.087	0.086	0.085
99A	0.088	0.086	0.085	0.084	0.083	0.079	0.07	0.066	0.06	0.052	0.049
99B	0.104	0.101	0.1	0.1	0.097	0.093	0.085	0.08	0.073	0.062	0.057
C99	0.106	0.102	0.101	0.1	0.096	0.092	0.086	0.081	0.073	0.062	0.056
100A	0.168	0.158	0.132	0.141	0.624	1.683	2.386	2.672	3.074	3.438	3.04
100B	0.294	0.299	0.287	0.453	1.457	2.704	OVER	OVER	OVER	OVER	3.156
C100	0.17	0.169	0.167	0.165	0.161	0.158	0.152	0.147	0.135	0.133	0.138
101A	0.015	0.013	0.015	0.015	0.024	0.076	0.133	0.139	0.104	0.034	0.025
101B	0.012	0.012	0.013	0.013	0.024	0.074	0.128	0.133	0.097	0.028	0.028
C101	0.012	0.011	0.012	0.011	0.013	0.014	0.016	0.02	0.032	0.045	0.04
102A	0.153	1.131	1.588	1.844	1.893	1.713	0.637	0.366	0.118	0.091	0.084
102B	0.147	1.174	1.641	1.894	1.947	1.716	0.063	0.359	0.112	0.067	0.059
C102	0.051	0.051	0.055	0.055	0.052	0.054	0.055	0.057	0.056	0.06	0.06
103A	0.043	0.049	0.042	0.043	0.074	0.151	0.193	0.198	0.098	0.033	0.025
103B	0.045	0.04	0.041	0.042	0.072	0.153	0.201	0.2	0.089	0.031	0.028
C103	0.043	0.04	0.04	0.038	0.044	0.048	0.064	0.021	0.024	0.042	0.028
104A	0.225	1.28	1.712	1.904	1.9	1.328	0.615	0.321	0.133	0.082	0.09
104B	0.228	1.25	1.673	1.881	1.873	1.264	0.616	0.242	0.127	0.067	0.06
C104	0.081	0.081	0.08	0.079	0.083	0.084	0.092	0.103	0.108	0.079	0.057
105A	0.018	0.017	0.019	0.025	0.063	0.141	0.177	0.172	0.142	0.047	0.024
105B	0.021	0.018	0.019	0.027	0.065	0.148	0.179	0.174	0.145	0.048	0.029
C105	0.02	0.018	0.019	0.019	0.02	0.021	0.025	0.03	0.047	0.055	0.038
106A	0.451	1.81	2.093	2.229	2.205	1.096	0.553	0.297	0.173	0.108	0.094
106B	0.457	1.837	2.124	2.246	2.236	1.172	0.58	0.359	0.204	0.154	0.134
C106	0.092	0.091	0.094	0.093	0.094	0.094	0.097	0.099	0.106	0.113	0.098
107A	0.051	0.047	0.049	0.064	0.129	0.219	0.221	0.208	0.122	0.05	0.058
107B	0.048	0.046	0.047	0.064	0.133	0.224	0.242	0.21	0.077	0.038	0.028
C107	0.053	0.049	0.047	0.046	0.048	0.058	0.082	0.09	0.096	0.047	0.026
108A	0.58	1.937	2.192	2.275	2.062	0.965	0.535	0.337	0.182	0.117	0.108
108B	0.587	1.922	2.186	2.263	2.074	0.962	0.554	0.329	0.18	0.11	0.112
C108	0.125	0.122	0.123	0.12	0.121	0.126	0.141	0.148	0.151	0.108	0.099
109A	0.017	0.018	0.019	0.018	0.02	0.022	0.019	0.017	0.015	0.021	0.023
109B	0.017	0.017	0.018	0.018	0.019	0.02	0.019	0.016	0.015	0.02	0.024
C109	0.017	0.018	0.019	0.017	0.017	0.017	0.015	0.015	0.016	0.012	0.012
110A	0.067	0.063	0.038	0.035	1.723	OVER	OVER	OVER	OVER	3.427	OVER
110B	0.067	0.062	0.038	0.036	1.778	OVER	OVER	OVER	OVER	3.45	OVER
C110	0.045	0.045	0.045	0.044	0.044	0.044	0.045	0.045	0.043	0.043	0.043
111A	0.041	0.04	0.041	0.04	0.04	0.038	0.031	0.026	0.021	0.017	0.014
111B	0.047	0.047	0.045	0.043	0.043	0.041	0.037	0.033	0.024	0.023	0.012
C111	0.043	0.042	0.041	0.041	0.038	0.036	0.032	0.03	0.024	0.016	0.015
112A	0.099	0.084	0.064	0.064	2.392	OVER	OVER	OVER	OVER	3.403	3.496
112B	0.096	0.081	0.063	0.061	2.348	OVER	OVER	OVER	OVER	3.443	3.491
C112	0.072	0.071	0.071	0.069	0.067	0.066	0.064	0.063	0.057	0.049	0.049
113A	0.018	0.018	0.019	0.027	0.097	0.191	0.226	0.224	0.162	0.046	0.023
113B	0.018	0.019	0.02	0.028	0.093	0.191	0.225	0.243	0.192	0.106	0.049
C113	0.018	0.018	0.019	0.017	0.018	0.019	0.022	0.023	0.037	0.047	0.044
114A	0.493	2.4	2.884	3.241	3.313	1.168	0.547	0.341	0.196	0.13	0.15
114B	0.449	2.289	2.813	3.125	3.226	1.257	0.588	0.421	0.251	0.128	0.177
C114	0.044	0.045	0.045	0.044	0.044	0.044	0.047	0.045	0.046	0.057	0.062
115A	0.043	0.046	0.045	0.062	0.157	0.248	0.276	0.253	0.14	0.042	0.028
115B	0.043	0.043	0.045	0.064	0.164	0.261	0.289	0.265	0.137	0.046	0.029
C115	0.046	0.044	0.044	0.042	0.042	0.046	0.065	0.077	0.082	0.045	0.025
116A	0.59	2.41	2.847	3.124	2.883	1.255	0.543	0.353	0.147	0.08	0.098
116B	0.588	2.438	2.846	3.106	2.85	1.164	0.517	0.322	0.103	0.056	0.056
C116	0.07	0.069	0.069	0.067	0.067	0.067	0.089	0.106	0.114	0.068	0.071
117A	0.036	0.048	0.06	0.077	0.146	0.519	0.675	0.603	0.523	0.399	0.32
117B	0.035	0.048	0.059	0.075	0.14	0.513	0.676	0.6	0.521	0.392	0.306
C117	0.035	0.042	0.049	0.056	0.074	0.184	0.58	0.746	0.643	0.48	0.386
118A	0.351	2.226	3.089	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
118B	0.349	2.197	3.034	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C118	0.064	0.09	0.125	0.286	0.549	1.357	OVER	OVER	OVER	OVER	OVER
119A	0.083	0.095	0.106	0.125	0.236	0.608	0.685	0.641	0.573	0.425	0.252
119B	0.092	0.105	0.12	0.141	0.275	0.622	0.671	0.638	0.578	0.479	0.403
C119	0.08	0.086	0.093	0.101	0.131	0.396	0.617	0.735	0.692	0.587	0.499
120A	0.459	2.309	3.163	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
120B	0.478	2.291	3.136	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C120	0.102	0.13	0.188	0.384	0.631	1.479	OVER	OVER	OVER	OVER	OVER
121A	0.046	0.067	0.091	0.145	0.566	1.046	1.532	1.365	1.195	0.971	0.829
121B	0.05	0.07	0.095	0.154	0.585	1.072	1.586	1.372	1.207	0.984	0.837
C121	0.043	0.053	0.062	0.073	0.13	0.498	1.027	1.551	1.417	1.153	0.985
122A	1.424	3.176	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
122B	1.437	3.289	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C122	0.113	0.165	0.328	0.471	0.871	2.779	OVER	OVER	OVER	OVER	OVER
123A	0.085	0.105	0.136	0.224	0.657	1.08	1.512	1.42	1.27	1.047	0.896
123B	0.103	0.123	0.154	0.259	0.682	1.085	1.505	1.447	1.319	1.146	0.936
C123	0.09	0.1	0.11	0.129	0.307	0.624	1.024	1.468	1.451	1.245	1.09
124A	1.616	3.259	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
124B	1.633	3.161	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C124	0.178	0.275	0.465	0.605	1.055	2.933	OVER	OVER	OVER	OVER	OVER

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
125A	0.032	0.034	0.039	0.051	0.081	0.275	0.656	0.8	0.691	0.381	0.386
125B	0.028	0.033	0.039	0.05	0.073	0.248	0.645	0.789	0.69	0.496	0.384
C125	0.028	0.029	0.031	0.032	0.033	0.037	0.043	0.047	0.197	0.807	0.789
126A	0.6	1.981	2.841	OVER	OVER	OVER	OVER	OVER	3.367	OVER	3.408
126B	0.596	1.997	2.87	OVER	OVER	OVER	OVER	OVER	3.332	OVER	3.433
C126	0.049	0.054	0.056	0.058	0.068	0.096	0.466	1.137	3.325	OVER	3.44
127A	0.063	0.07	0.077	0.092	0.142	0.411	0.68	0.782	0.726	0.592	0.481
127B	0.08	0.085	0.092	0.108	0.173	0.446	0.686	0.782	0.762	0.658	0.512
C127	0.065	0.067	0.069	0.072	0.078	0.094	0.23	0.326	0.562	0.804	0.693
128A	0.75	2.091	2.939	OVER	OVER	OVER	OVER	OVER	3.417	OVER	3.445
128B	0.776	2.139	3.011	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.431
C128	0.082	0.085	0.092	0.102	0.14	0.304	0.952	1.918	3.413	OVER	OVER
129A	0.039	0.046	0.058	0.084	0.26	0.624	1.23	1.55	1.535	1.201	1.017
129B	0.036	0.046	0.058	0.083	0.261	0.62	1.243	1.578	1.582	1.214	1.032
C129	0.032	0.033	0.035	0.036	0.038	0.042	0.055	0.116	0.414	1.381	1.592
130A	1.427	3.093	OVER	OVER	OVER	OVER	OVER	OVER	0.78	0.371	0.392
130B	1.436	3.091	OVER	OVER	OVER	OVER	OVER	OVER	0.885	0.436	0.331
C130	0.091	0.092	0.096	0.105	0.1213	0.304	1.399	2.834	3.398	0.754	0.507
131A	0.076	0.089	0.104	0.151	0.393	0.675	1.089	1.36	1.513	1.227	1.118
131B	0.079	0.09	0.105	0.158	0.406	0.694	1.124	1.402	1.484	1.235	1.013
C131	0.081	0.083	0.087	0.091	0.102	0.17	0.346	0.476	0.934	1.573	1.407
132A	1.618	3.141	OVER	OVER	OVER	OVER	OVER	OVER	1.404	0.509	0.576
132B	1.622	3.229	OVER	OVER	OVER	OVER	OVER	OVER	0.953	0.531	0.516
C132	0.142	0.15	0.157	0.179	0.278	0.544	1.72	OVER	3.353	0.811	0.549
133A	0.04	0.055	0.067	0.097	0.225	0.58	0.58	0.522	0.452	0.373	0.316
133B	0.039	0.053	0.066	0.096	0.224	0.589	0.58	0.523	0.455	0.372	0.314
C133	0.039	0.048	0.054	0.063	0.083	0.183	0.57	0.765	0.675	0.548	0.472
134A	0.582	2.75	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
134B	0.618	2.79	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C134	0.068	0.091	0.115	0.283	0.574	0.1382	OVER	OVER	OVER	OVER	OVER
135A	0.071	0.086	0.099	0.136	0.318	0.64	0.603	0.562	0.494	0.421	0.359
135B	0.076	0.096	0.111	0.145	0.316	0.628	0.611	0.606	0.5	0.421	0.41
C135	0.081	0.1	0.107	0.133	0.154	0.483	0.762	0.773	0.69	0.641	0.57
136A	0.804	2.898	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
136B	0.8	2.864	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C136	0.101	0.124	0.154	0.379	0.656	1.5	OVER	OVER	OVER	OVER	OVER
137A	0.033	0.039	0.048	0.072	0.172	0.56	0.778	0.675	0.576	0.49	0.414
137B	0.03	0.039	0.049	0.073	0.169	0.529	0.771	0.684	0.585	0.473	0.402
C137	0.028	0.03	0.03	0.031	0.033	0.035	0.04	0.045	0.146	0.576	0.864
138A	1.219	3.178	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
138B	1.234	3.201	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C138	0.063	0.07	0.064	0.065	0.1	0.15	0.407	1.06	OVER	OVER	OVER
139A	0.066	0.077	0.088	0.121	0.29	0.6	0.762	0.722	0.649	0.583	0.498
139B	0.065	0.074	0.085	0.119	0.289	0.6	0.731	0.686	0.613	0.572	0.545
C139	0.07	0.077	0.076	0.072	0.082	0.083	0.145	0.263	0.471	0.72	0.691
140A	1.399	3.298	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
140B	1.403	3.312	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C140	0.077	0.097	0.11	0.106	0.122	0.25	0.75	1.807	OVER	OVER	OVER
141A	0.047	0.061	0.094	0.157	0.241	0.36	0.494	0.569	0.692	0.819	0.859
141B	0.046	0.059	0.08	0.157	0.235	0.354	0.492	0.568	0.693	0.828	0.863
C141	0.04	0.043	0.044	0.047	0.05	0.066	0.104	0.113	0.142	0.237	0.298
142A	0.787	2.006	2.726	3.472	3.213	OVER	OVER	3.426	0.655	0.179	0.17
142B	0.801	2.039	2.709	OVER	3.262	OVER	OVER	3.475	0.756	0.21	0.159
C142	0.05	0.057	0.062	0.078	0.091	0.106	0.137	0.169	0.279	0.568	0.655
143A	0.078	0.093	0.122	0.208	0.29	0.408	0.533	0.608	0.744	0.885	0.86
143B	0.073	0.093	0.124	0.208	0.301	0.405	0.53	0.612	0.756	0.863	0.921
C143	0.076	0.081	0.085	0.093	0.118	0.162	0.19	0.206	0.27	0.411	0.47
144A	0.898	2.114	2.823	OVER	OVER	OVER	OVER	2.767	0.522	0.139	0.117
144B	0.926	2.133	2.84	OVER	OVER	OVER	OVER	2.787	0.536	0.157	0.128
C144	0.081	0.102	0.127	0.139	OVER	0.182	0.231	0.272	0.42	0.668	0.667
145A	0.065	0.105	0.175	0.255	0.372	0.497	0.615	0.673	0.784	0.89	0.867
145B	0.058	0.098	0.168	0.246	0.365	0.489	0.612	0.685	0.796	0.896	0.87
C145	0.048	0.049	0.052	0.056	0.065	0.101	0.116	0.126	0.162	0.257	0.319
146A	1.547	2.977	3.428	OVER	OVER	OVER	3.442	1.352	0.406	0.198	0.148
146B	1.557	2.997	3.358	OVER	OVER	OVER	OVER	1.306	0.411	0.196	0.177
C146	0.092	0.101	0.114	0.125	0.136	0.155	0.201	0.25	0.416	0.694	0.464
147A	0.089	0.147	0.225	0.302	0.416	0.546	0.673	0.744	0.884	0.914	0.788
147B	0.095	0.148	0.225	0.306	0.419	0.544	0.664	0.733	0.865	0.887	0.741
C147	0.09	0.096	0.106	0.13	0.177	0.196	0.232	0.27	0.325	0.494	0.563
148A	1.707	3.087	OVER	OVER	OVER	OVER	1.913	0.85	0.28	0.168	0.159
148B	1.7	3.084	OVER	OVER	OVER	OVER	2.2	0.849	0.316	0.155	0.137
C148	0.132	0.169	0.18	0.194	0.212	0.247	0.309	0.368	0.578	0.71	0.313
149A	0.055	0.071	0.095	0.203	0.291	0.415	0.564	0.696	0.891	1.045	0.9
149B	0.041	0.055	0.062	0.123	0.211	0.329	0.47	0.594	0.804	0.98	0.779
C149	0.044	0.048	0.05	0.051	0.058	0.082	0.148	0.174	0.232	0.388	0.57
150A	0.719	2.07	2.655	3.469	3.377	0.898	0.716	0.478	0.257	0.16	0.164
150B	0.74	2.148	2.812	OVER	OVER	2.376	1.259	0.897	0.359	0.169	0.142
C150	0.048	0.049	0.049	0.058	0.076	0.095	0.126	0.18	0.426	1.251	0.18
151A	0.08	0.105	0.129	0.231	0.316	0.429	0.552	0.644	0.801	0.948	0.874
151B	0.085	0.112	0.141	0.255	0.343	0.461	0.588	0.681	0.858	1.027	0.935
C151	0.08	0.082	0.084	0.092	0.111	0.168	0.197	0.228	0.311	0.516	0.693
152A	0.885	2.22	2.811	OVER	2.644	1.286	0.727	0.52	0.282	0.176	0.162
152B	0.908	2.332	3.086	OVER	OVER	OVER	OVER	OVER	0.744	0.282	0.289
C152	0.114	0.179	0.191	0.206	0.242	0.289	0.367	0.467	0.812	0.602	0.185
153A	0.051	0.087	0.145	0.234	0.343	0.482	0.657	0.785	1.069	1.478	0.291
153B	0.061	0.108	0.18	0.268	0.382	0.521	0.692	0.833	1.102	1.615	1.59
C153	0.043	0.045	0.046	0.047	0.051	0.063	0.112	0.135	0.177	0.329	0.536

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
154A	1.524	3.348	OVER	OVER	OVER	3.141	1.061	0.716	0.396	0.197	0.197
154B	1.524	3.243	OVER	OVER	OVER	2.449	0.636	0.406	0.356	0.187	0.181
C154	0.095	0.112	0.13	0.146	0.161	0.192	0.272	0.397	0.913	0.503	0.184
155A	0.099	0.183	0.258	0.347	0.466	0.613	0.768	0.894	1.16	1.551	1.658
155B	0.123	0.222	0.299	0.392	0.514	0.655	0.8	0.919	1.148	1.448	1.679
C155	0.098	0.114	0.133	0.208	0.243	0.277	0.329	0.385	0.531	0.772	1.027
156A	1.738	OVER	OVER	OVER	OVER	OVER	OVER	1.321	0.528	0.371	0.253
156B	1.796	OVER	OVER	OVER	OVER	OVER	OVER	1.525	0.56	0.26	0.291
C156	0.189	0.201	0.232	0.258	0.294	0.357	0.469	0.611	1.148	0.44	0.206
157A	0.043	0.073	0.141	0.243	0.382	0.57	0.759	0.891	0.967	0.407	0.178
157B	0.047	0.081	0.149	0.252	0.389	0.579	0.782	0.915	1.022	0.768	0.569
C157	0.038	0.039	0.038	0.04	0.041	0.043	0.048	0.057	0.095	0.193	0.242
158A	1.407	OVER	OVER	OVER	1.8	1.152	0.611	0.41	0.227	0.145	0.117
158B	1.415	OVER	OVER	OVER	1.701	1.178	0.717	0.436	0.202	0.159	0.131
C158	0.047	0.051	0.053	0.058	0.076	0.09	0.112	0.149	0.367	0.303	0.122
159A	0.077	0.123	0.196	0.3	0.439	0.62	0.786	0.895	0.969	0.793	0.713
159B	0.076	0.116	0.187	0.293	0.429	0.615	0.786	0.881	0.939	0.675	0.516
C159	0.063	0.064	0.067	0.067	0.074	0.104	0.131	0.151	0.219	0.384	0.44
160A	1.6	OVER	OVER	OVER	3.413	1.98	1.354	1.083	0.428	0.327	0.32
160B	1.565	OVER	OVER	OVER	2.471	1.441	0.981	0.849	0.736	0.44	0.436
C160	0.077	0.087	0.1	0.125	0.139	0.16	0.203	0.267	0.523	0.266	0.145
161A	0.053	0.092	0.168	0.282	0.42	0.62	0.836	0.991	0.984	0.821	0.756
161B	0.055	0.093	0.167	0.28	0.42	0.613	0.838	0.983	0.995	0.816	0.76
C161	0.05	0.054	0.058	0.063	0.08	0.157	0.189	0.225	0.308	0.489	0.544
162A	1.718	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.256	1.562	1.188
162B	1.778	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.691
C162	0.066	0.089	0.125	0.141	0.166	0.207	0.294	0.401	0.917	0.567	0.293
163A	0.076	0.132	0.225	0.333	0.474	0.665	0.828	0.942	0.982	0.855	0.795
163B	0.077	0.129	0.221	0.334	0.474	0.666	0.852	0.949	0.97	0.785	0.653
C163	0.078	0.091	0.09	0.124	0.184	0.228	0.254	0.29	0.394	0.602	0.628
164A	1.942	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.864
164B	1.922	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.441	1.882
C164	0.107	0.168	0.182	0.203	0.235	0.292	0.398	0.61	1.221	0.49	0.216
165A	0.053	0.068	0.085	0.11	0.15	0.199	0.249	0.246	0.175	0.077	0.054
165B	0.052	0.069	0.085	0.109	0.151	0.201	0.249	0.26	0.165	0.058	0.043
C165	0.05	0.054	0.057	0.06	0.067	0.072	0.074	0.074	0.068	0.047	0.036
166A	0.762	1.198	1.274	1.287	1.239	1.104	0.537	0.343	0.156	0.143	0.133
166B	0.786	1.205	1.275	1.279	1.239	1.118	0.552	0.365	0.149	0.169	0.14
C166	0.062	0.069	0.076	0.076	0.079	0.08	0.083	0.085	0.083	0.084	0.071
167A	0.074	0.092	0.107	0.132	0.175	0.222	0.246	0.21	0.102	0.06	0.0499
167B	0.078	0.096	0.111	0.137	0.173	0.226	0.24	0.212	0.097	0.057	0.043
C167	0.073	0.077	0.076	0.079	0.08	0.084	0.077	0.064	0.04	0.031	0.027
168A	0.866	1.23	1.298	1.298	1.216	0.997	0.496	0.33	0.157	0.158	0.156
168B	0.869	1.223	1.301	1.298	1.22	0.991	0.512	0.32	0.156	0.155	0.146
C168	0.096	0.1	0.101	0.103	0.104	0.106	0.103	0.094	0.069	0.069	0.067
169A	0.263	0.375	0.434	0.494	0.569	0.649	0.728	0.74	0.27	0.124	0.082
169B	0.281	0.392	0.451	0.51	0.586	0.664	0.729	0.714	0.256	0.102	0.08
C169	0.27	0.377	0.432	0.481	0.542	0.601	0.664	0.652	0.232	0.095	0.066
170A	1.315	3.22	OVER	OVER	OVER	OVER	OVER	OVER	2.605	1.154	0.594
170B	1.345	3.28	OVER	OVER	OVER	OVER	OVER	OVER	2.016	0.89	0.668
C170	0.461	0.61	0.697	0.778	0.847	0.879	0.592	0.53	0.362	0.356	0.33
171A	0.234	0.394	0.471	0.538	0.615	0.664	0.603	0.538	0.31	0.191	0.112
171B	0.227	0.37	0.448	0.518	0.602	0.662	0.622	0.569	0.364	0.18	0.119
C171	0.248	0.376	0.429	0.475	0.533	0.568	0.514	0.466	0.296	0.171	0.131
172A	1.837	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.181	1.228	1.993
172B	1.847	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.475	1.408	1.285
C172	0.273	0.386	0.462	0.53	0.586	0.649	0.742	0.73	0.532	0.4	0.378
173A	0.091	0.127	0.157	0.191	0.251	0.365	0.509	0.603	0.766	0.959	1.146
173B	0.086	0.126	0.153	0.191	0.263	0.378	0.536	0.642	0.823	1.044	1.271
C173	0.08	0.107	0.118	0.132	0.153	0.178	0.209	0.228	0.266	0.323	0.379
174A	0.847	2.932	OVER	OVER	OVER	OVER	OVER	OVER	1.779	1.098	0.677
174B	0.897	3.034	OVER	OVER	OVER	OVER	OVER	3.001	1.493	0.957	0.468
C174	0.117	0.138	0.156	0.173	0.188	0.215	0.248	0.28	0.36	0.526	0.72
175A	0.123	0.174	0.201	0.25	0.325	0.443	0.603	0.7	0.897	0.967	0.643
175B	0.135	0.184	0.214	0.254	0.326	0.44	0.622	0.712	0.89	1.11	1.265
C175	0.117	0.162	0.167	0.173	0.195	0.224	0.256	0.273	0.31	0.385	0.418
176A	0.981	2.992	OVER	OVER	OVER	OVER	OVER	3.145	1.809	1.184	0.65
176B	0.945	2.767	OVER	OVER	OVER	OVER	1.325	0.964	0.685	0.557	0.52
C176	0.156	0.183	0.206	0.223	0.248	0.275	0.319	0.347	0.465	0.654	0.869
177A	0.11	0.16	0.199	0.263	0.378	0.542	0.705	0.783	0.892	1.046	1.237
177B	0.106	0.151	0.186	0.246	0.353	0.498	0.644	0.717	0.82	0.957	1.118
C177	0.1	0.127	0.138	0.156	0.184	0.222	0.246	0.266	0.312	0.393	0.479
178A	1.797	OVER	OVER	OVER	OVER	OVER	2.151	1.516	1.199	1.277	1.319
178B	1.808	OVER	OVER	OVER	OVER	OVER	1.457	1.397	1.289	1.406	1.343
C178	0.155	0.185	0.199	0.213	0.233	0.261	0.308	0.35	0.465	0.716	1.013
179A	0.152	0.216	0.257	0.326	0.441	0.605	0.766	0.85	0.999	1.237	1.389
179B	0.162	0.219	0.26	0.325	0.445	0.616	0.789	0.877	1.03	1.246	1.473
C179	0.139	0.17	0.187	0.205	0.236	0.27	0.304	0.325	0.38	0.477	0.55
180A	1.813	OVER	OVER	OVER	OVER	OVER	2.989	1.761	1.262	1.487	1.792
180B	1.937	OVER	OVER	OVER	OVER	OVER	1.898	1.411	1.231	1.552	1.783
C180	0.21	0.252	0.27	0.288	0.315	0.356	0.424	0.489	0.658	0.992	1.325
181A	0.101	0.15	0.188	0.245	0.336	0.53	0.747	0.836	0.915	0.472	0.362
181B	0.101	0.152	0.189	0.247	0.334	0.527	0.751	0.854	0.979	0.618	0.475
C181	0.084	0.108	0.119	0.131	0.147	0.176	0.206	0.226	0.265	0.313	0.352
182A	1.743	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.188	0.085
182B	1.294	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.517	0.392
C182	0.108	0.139	0.155	0.17	0.188	0.216	0.255	0.289	0.388	0.552	0.703

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
183A	0.131	0.192	0.232	0.292	0.384	0.579	0.788	0.927	0.582	0.311	0.232
183B	0.141	0.2	0.234	0.292	0.379	0.567	0.795	0.951	1.311	1.262	1.153
C183	0.12	0.151	0.163	0.178	0.195	0.226	0.258	0.279	0.326	0.389	0.434
184A	1.558	3.096	OVER	OVER	OVER	OVER	1.642	1.263	0.886	0.601	0.408
184B	1.816	OVER	OVER	OVER	OVER	3.47	1.386	1.12	1.008	0.789	0.549
C184	0.166	0.2	0.217	0.235	0.267	0.304	0.331	0.375	0.494	0.683	0.851
185A	0.035	0.034	0.036	0.038	0.04	0.046	0.063	0.139	0.315	0.352	0.361
185B	0.032	0.032	0.032	0.034	0.037	0.045	0.063	0.135	0.327	0.372	0.382
C185	0.034	0.034	0.034	0.035	0.036	0.04	0.044	0.047	0.055	0.065	0.074
186A	0.057	0.126	0.222	0.52	0.905	1.162	1.319	1.37	1.388	1.415	1.423
186B	0.06	0.128	0.225	0.52	0.884	1.149	1.306	1.371	1.391	1.411	1.426
C186	0.047	0.044	0.042	0.045	0.044	0.045	0.044	0.045	0.055	0.076	0.099
187A	0.101	0.101	0.101	0.102	0.104	0.108	0.143	0.266	0.397	0.438	0.451
187B	0.096	0.096	0.096	0.097	0.099	0.106	0.14	0.261	0.383	0.418	0.453
C187	0.096	0.096	0.095	0.094	0.095	0.1	0.107	0.117	0.14	0.136	0.164
188A	0.146	0.219	0.327	0.635	0.99	1.241	1.408	1.478	1.521	1.578	1.589
188B	0.159	0.226	0.335	0.641	0.997	1.25	1.413	1.478	1.524	1.539	1.537
C188	0.123	0.121	0.121	0.121	0.12	0.128	0.147	0.179	0.223	0.255	0.272
189A	0.032	0.032	0.033	0.035	0.037	0.045	0.142	0.253	0.311	0.327	0.333
189B	0.033	0.034	0.036	0.036	0.039	0.048	0.179	0.275	0.32	0.335	0.339
C189	0.034	0.033	0.033	0.035	0.035	0.038	0.041	0.044	0.054	0.07	0.082
190A	0.128	0.329	0.544	0.811	1.051	1.213	1.282	1.273	1.29	1.334	1.349
190B	0.128	0.323	0.533	0.806	1.05	1.203	1.262	1.261	1.277	1.321	1.339
C190	0.087	0.085	0.086	0.085	0.083	0.083	0.086	0.088	0.099	0.13	0.157
191A	0.099	0.1	0.097	0.102	0.1	0.124	0.297	0.377	0.429	0.451	0.466
191B	0.108	0.105	0.104	0.105	0.106	0.124	0.28	0.356	0.412	0.439	0.433
C191	0.104	0.103	0.103	0.1	0.099	0.101	0.105	0.114	0.148	0.148	0.182
192A	0.204	0.425	0.641	0.902	1.115	1.275	1.343	1.358	1.368	1.412	1.435
192B	0.212	0.427	0.64	0.903	1.118	1.278	1.343	1.363	1.375	1.413	1.434
C192	0.173	0.17	0.169	0.171	0.173	0.193	0.235	0.27	0.314	0.367	0.398
193A	0.019	0.019	0.022	0.028	0.039	0.069	0.11	0.139	0.164	0.174	0.171
193B	0.02	0.024	0.037	0.034	0.045	0.084	0.114	0.144	0.178	0.172	0.173
C193	0.016	0.017	0.018	0.021	0.023	0.024	0.025	0.025	0.023	0.023	0.022
194A	0.191	0.911	1.688	2.075	2.096	1.887	0.722	0.401	0.172	0.103	0.107
194B	0.179	0.893	1.667	2.063	2.103	1.904	0.705	0.411	0.21	0.133	0.127
C194	0.056	0.06	0.057	0.058	0.06	0.062	0.063	0.062	0.06	0.059	0.059
195A	0.041	0.043	0.045	0.052	0.065	0.097	0.137	0.163	0.195	0.206	0.212
195B	0.035	0.038	0.04	0.046	0.058	0.091	0.134	0.159	0.191	0.197	0.21
C195	0.04	0.039	0.04	0.041	0.041	0.042	0.044	0.042	0.042	0.037	0.042
196A	0.24	0.951	1.689	2.029	2.09	1.608	0.668	0.406	0.168	0.106	0.095
196B	0.238	0.979	1.742	2.075	2.141	1.619	0.731	0.486	0.218	0.143	0.163
C196	0.085	0.085	0.086	0.088	0.088	0.088	0.086	0.086	0.081	0.08	0.077
197A	0.024	0.026	0.032	0.042	0.067	0.114	0.154	0.167	0.184	0.185	0.191
197B	0.026	0.03	0.032	0.043	0.068	0.119	0.157	0.172	0.183	0.189	0.194
C197	0.022	0.023	0.024	0.026	0.027	0.028	0.029	0.029	0.028	0.027	0.026
198A	0.465	1.674	2.2	2.289	2.262	1.171	0.532	0.375	0.207	0.129	0.128
198B	0.468	1.667	2.2	2.268	2.24	1.179	0.543	0.37	0.207	0.14	0.139
C198	0.096	0.095	0.093	0.097	0.098	0.099	0.098	0.099	0.099	0.101	0.1
199A	0.06	0.063	0.068	0.079	0.106	0.154	0.192	0.208	0.219	0.233	0.247
199B	0.061	0.065	0.07	0.082	0.111	0.16	0.201	0.216	0.229	0.234	0.242
C199	0.061	0.061	0.062	0.063	0.063	0.064	0.064	0.06	0.06	0.055	0.056
200A	0.568	1.795	2.217	2.296	2.204	1.031	0.571	0.358	0.19	0.14	0.127
200B	0.561	1.782	2.218	2.279	2.199	1.002	0.584	0.407	0.227	0.144	0.131
C200	0.125	0.127	0.128	0.129	0.13	0.132	0.136	0.139	0.131	0.132	0.125
201A	0.021	0.02	0.021	0.023	0.024	0.031	0.176	0.318	0.456	0.496	0.51
201B	0.021	0.02	0.021	0.022	0.024	0.036	0.192	0.332	0.468	0.511	0.523
C201	0.02	0.019	0.019	0.022	0.02	0.022	0.023	0.024	0.028	0.033	0.039
202A	0.081	0.233	0.587	1.438	2.179	2.685	3.105	3.152	2.918	2.899	2.986
202B	0.086	0.235	0.595	1.468	2.196	2.763	3.203	3.294	2.981	2.933	3.048
C202	0.045	0.046	0.046	0.044	0.045	0.046	0.046	0.046	0.046	0.048	0.056
203A	0.057	0.056	0.056	0.056	0.057	0.066	0.26	0.37	0.506	0.555	0.57
203B	0.067	0.065	0.067	0.066	0.067	0.074	0.268	0.377	0.505	0.549	0.566
C203	0.066	0.065	0.064	0.064	0.063	0.063	0.066	0.072	0.082	0.089	0.101
204A	0.127	0.288	0.683	1.546	2.26	2.769	3.108	3.279	3.023	3.004	3.114
204B	0.124	0.285	0.675	1.561	2.292	2.82	3.238	3.367	3.048	3.003	3.102
C204	0.078	0.078	0.076	0.076	0.077	0.073	0.072	0.067	0.081	0.128	0.148
205A	0.021	0.024	0.028	0.039	0.074	0.158	0.263	0.321	0.421	0.469	0.428
205B	0.021	0.025	0.027	0.04	0.073	0.156	0.26	0.31	0.404	0.463	0.453
C205	0.022	0.022	0.022	0.026	0.026	0.029	0.033	0.036	0.033	0.031	0.03
206A	0.422	1.85	2.85	3.38	OVER	1.349	0.621	0.387	0.198	0.183	0.178
206B	0.429	1.858	2.896	3.449	OVER	1.224	0.651	0.42	0.231	0.197	0.191
C206	0.045	0.05	0.048	0.052	0.052	0.0552	0.049	0.054	0.053	0.057	0.059
207A	0.054	0.057	0.061	0.073	0.114	0.193	0.295	0.353	0.449	0.444	0.258
207B	0.056	0.057	0.059	0.072	0.114	0.199	0.3	0.352	0.455	0.448	0.288
C207	0.05	0.048	0.05	0.054	0.055	0.056	0.055	0.054	0.056	0.051	0.048
208A	0.547	2.064	2.889	3.316	3.274	1.186	0.586	0.377	0.148	0.171	0.132
208B	0.525	2.041	2.861	3.363	3.434	1.306	0.629	0.445	0.159	0.188	0.199
C208	0.069	0.067	0.068	0.069	0.07	0.071	0.071	0.068	0.07	0.073	0.07
209A	0.076	0.139	0.166	0.212	0.301	0.439	0.645	0.768	0.893	0.776	0.727
209B	0.075	0.141	0.167	0.212	0.303	0.446	0.637	0.762	0.898	0.774	0.726
C209	0.082	0.125	0.14	0.164	0.202	0.256	0.336	0.405	0.533	0.766	0.858
210A	0.623	2.23	2.957	OVER	OVER	OVER	OVER	OVER	OVER	3.423	OVER
210B	0.646	2.248	2.971	OVER	OVER	OVER	OVER	OVER	OVER	3.409	OVER
C210	0.125	0.178	0.2	0.24	0.312	0.435	0.682	0.916	1.546	2.984	OVER
211A	0.121	0.184	0.21	0.257	0.342	0.477	0.655	0.763	0.827	0.729	0.678
211B	0.129	0.188	0.214	0.259	0.347	0.485	0.662	0.785	0.867	0.755	0.694
C211	0.137	0.178	0.191	0.216	0.252	0.307	0.387	0.441	0.573	0.793	0.768

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
212A	0.743	2.287	2.988	OVER	OVER	OVER	OVER	OVER	3.344	OVER	OVER
212B	0.768	2.324	3.015	OVER	OVER	OVER	OVER	OVER	3.28	3.361	OVER
C212	0.186	0.24	0.263	0.303	0.379	0.501	0.765	0.983	1.573	2.946	OVER
213A	0.11	0.185	0.224	0.297	0.445	0.675	1	1.241	1.597	1.65	1.489
213B	0.111	0.187	0.225	0.299	0.446	0.681	1.013	1.25	1.602	1.633	1.478
C213	0.098	0.144	0.16	0.187	0.231	0.299	0.411	0.51	0.708	1.134	1.59
214A	1.296	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
214B	1.335	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.467	OVER
C214	0.179	0.24	0.266	0.316	0.413	0.594	0.965	1.339	2.415	3.475	OVER
215A	0.152	0.226	0.265	0.336	0.477	0.685	0.968	1.187	1.495	1.534	1.368
215B	0.162	0.238	0.278	0.352	0.501	0.72	0.997	1.186	1.517	1.52	1.366
C215	0.135	0.179	0.193	0.222	0.266	0.337	0.442	0.516	0.72	1.138	1.579
216A	1.456	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
216B	1.49	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C216	0.236	0.298	0.326	0.377	0.476	0.651	0.994	1.319	2.365	3.446	OVER
217A	0.04	0.054	0.068	0.09	0.134	0.224	0.364	0.486	0.655	0.834	0.891
217B	0.041	0.055	0.066	0.091	0.136	0.229	0.321	0.511	0.667	0.844	0.868
C217	0.037	0.043	0.043	0.048	0.052	0.06	0.07	0.08	0.093	0.139	0.149
218A	0.517	1.868	2.857	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
218B	0.519	1.858	2.869	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C218	0.061	0.07	0.068	0.072	0.08	0.097	0.125	0.158	0.216	0.38	0.552
219A	0.069	0.083	0.096	0.121	0.166	0.257	0.383	0.522	0.644	0.819	0.817
219B	0.072	0.088	0.099	0.122	0.168	0.254	0.377	0.479	0.646	0.804	0.811
C219	0.062	0.068	0.069	0.072	0.077	0.086	0.095	0.104	0.117	0.151	0.173
220A	0.614	1.846	2.761	OVER	OVER	OVER	OVER	OVER	OVER	OVEr	OVER
220B	0.624	1.822	2.724	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C220	0.091	0.097	0.102	0.107	0.115	0.129	0.155	0.194	0.249	0.414	0.561
221A	0.052	0.073	0.094	0.134	0.209	0.354	0.525	0.676	0.841	1.108	1.316
221B	0.051	0.074	0.096	0.14	0.222	0.376	0.563	0.741	0.923	1.213	1.42
C221	0.044	0.046	0.048	0.053	0.058	0.065	0.076	0.088	0.105	0.147	0.179
222A	1.153	3.077	3.791	OVER	OVER	OVER	OVER	OVER	OVER	3.418	1.063
222B	1.168	3.084	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.013
C222	1.101	0.107	0.111	0.119	0.13	0.152	0.194	0.251	0.35	0.631	0.937
223A	0.09	0.11	0.133	0.178	0.264	0.411	0.564	0.692	0.905	1.152	1.332
223B	0.085	0.108	0.13	0.175	0.256	0.397	0.53	0.647	0.84	1.104	1.27
C223	0.069	0.078	0.079	0.083	0.089	0.097	0.107	0.116	0.131	0.171	0.208
224A	1.306	3.087	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.048
224B	1.315	3.079	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	1.187
C224	0.14	0.147	0.153	0.161	0.122	0.196	0.232	0.284	0.396	0.684	0.994
225A	0.062	0.149	0.188	0.262	0.406	0.582	0.842	0.929	0.832	0.754	0.708
225B	0.057	0.146	0.184	0.258	0.401	0.579	0.844	0.94	0.84	0.764	0.718
C225	0.06	0.115	0.132	0.157	0.2	0.242	0.336	0.414	0.571	0.846	0.938
226A	0.864	3.223	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
226B	0.878	3.179	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C226	0.115	0.167	0.191	0.232	0.315	0.41	0.65	0.923	1.666	3.329	3.299
227A	0.112	0.205	0.242	0.317	0.462	0.628	0.877	0.931	0.85	0.754	0.701
227B	0.129	0.217	0.255	0.327	0.46	0.611	0.852	0.904	0.825	0.754	0.698
C227	0.099	0.158	0.174	0.197	0.249	0.288	0.369	0.44	0.602	0.871	0.891
228A	1.028	3.264	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
228B	1.029	3.283	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C228	0.171	0.223	0.245	0.288	0.37	0.467	0.692	0.931	1.669	3.163	3.275
229A	0.044	0.066	0.082	0.122	0.215	0.361	0.655	0.833	0.935	0.821	0.776
229B	0.04	0.064	0.08	0.117	0.208	0.356	0.659	0.843	0.943	0.846	0.789
C229	0.032	0.038	0.041	0.044	0.055	0.056	0.067	0.076	0.094	0.136	0.184
230A	0.932	3.463	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
230B	0.934	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C230	0.054	0.061	0.063	0.067	0.085	0.089	0.117	0.146	0.22	0.45	0.786
231A	0.064	0.088	0.103	0.138	0.234	0.375	0.627	0.776	0.898	0.788	0.724
231B	0.077	0.102	0.117	0.154	0.25	0.395	0.637	0.761	0.857	0.747	0.688
C231	0.077	0.084	0.085	0.088	0.096	0.101	0.112	0.118	0.135	0.171	0.224
232A	1.093	3.389	OVER	OVER	3.376	OVER	OVER	OVER	OVER	OVER	3.495
232B	1.134	3.395	OVER	OVER	3.16	OVER	OVER	OVER	OVER	OVER	OVER
C232	0.094	0.103	0.107	0.112	0.128	0.136	0.162	0.186	0.269	0.48	0.771
233A	0.044	0.055	0.066	0.089	0.128	0.197	0.278	0.335	0.395	0.443	0.473
233B	0.044	0.053	0.064	0.087	0.128	0.199	0.282	0.338	0.398	0.449	0.479
C233	0.103	0.046	0.049	0.052	0.054	0.055	0.06	0.134	0.072	0.143	0.116
234A	0.508	1.651	2.547	OVER	OVER	OVER	OVER	0.985	0.343	0.21	0.156
234B	0.5	1.627	2.5	OVER	OVER	OVER	OVER	1.046	0.384	0.189	0.141
C234	0.051	0.052	0.054	0.057	0.059	0.064	0.068	0.073	0.085	0.112	0.138
235A	0.086	0.081	0.092	0.114	0.154	0.248	0.301	0.356	0.422	0.511	0.55
235B	0.076	0.084	0.097	0.12	0.163	0.233	0.314	0.374	0.446	0.494	0.529
C235	0.071	0.071	0.074	0.075	0.078	0.092	0.095	0.091	0.096	0.111	0.122
236A	0.612	1.746	2.617	OVER	OVER	OVER	OVER	0.897	0.383	0.25	0.286
236B	0.632	1.777	2.619	OVER	OVER	OVER	OVER	0.901	0.473	0.209	0.165
C236	0.082	0.085	0.087	0.091	0.095	0.098	0.106	0.111	0.126	0.152	0.179
237A	0.055	0.074	0.095	0.135	0.2	0.292	0.374	0.41	0.442	0.487	0.523
237B	0.055	0.073	0.092	0.13	0.196	0.283	0.358	0.391	0.43	0.468	0.501
C237	0.046	0.048	0.049	0.051	0.054	0.059	0.063	0.065	0.071	0.086	0.101
238A	1.11	2.638	3.244	OVER	OVER	OVER	3.152	0.815	0.38	0.24	0.2
238B	1.114	2.615	3.271	OVER	OVER	OVER	2.964	0.802	0.381	0.242	0.207
C238	0.092	0.095	0.096	0.101	0.104	0.106	0.115	0.121	0.139	0.172	0.203
239A	0.09	0.11	0.131	0.172	0.241	0.334	0.412	0.448	0.492	0.542	0.577
239B	0.09	0.112	0.127	0.166	0.232	0.332	0.394	0.421	0.46	0.504	0.546
C239	0.089	0.089	0.091	0.097	0.096	0.103	0.107	0.111	0.122	0.131	0.146
240A	1.304	2.76	3.374	OVER	OVER	OVER	1.473	0.829	0.428	0.256	0.222
240B	1.313	2.764	3.365	OVER	OVER	OVER	1.385	0.782	0.357	0.255	0.205
C240	0.136	0.159	0.15	0.142	0.145	0.173	0.175	0.182	0.207	0.239	0.282

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
241A	0.051	0.067	0.08	0.107	0.151	0.229	0.333	0.374	0.429	0.478	0.513
241B	0.051	0.068	0.082	0.11	0.154	0.229	0.325	0.364	0.417	0.467	0.502
C241	0.044	0.05	0.053	0.056	0.064	0.073	0.084	0.09	0.102	0.12	0.139
242A	0.693	2.18	2.99	OVER	OVER	OVER	1.226	0.676	0.3	0.193	0.252
242B	0.705	2.199	2.992	OVER	OVER	OVER	1.273	0.677	0.328	0.255	0.177
C242	0.062	0.069	0.073	0.077	0.085	0.095	0.108	0.117	0.136	0.17	0.205
243A	0.068	0.086	0.101	0.126	0.173	0.251	0.358	0.399	0.463	0.514	0.557
243B	0.068	0.085	0.099	0.126	0.17	0.247	0.353	0.395	0.459	0.512	0.556
C243	0.061	0.066	0.069	0.074	0.082	0.091	0.102	0.108	0.121	0.144	0.168
244A	0.803	2.292	3.14	OVER	OVER	OVER	1.371	0.77	0.339	0.189	0.203
244B	0.809	2.291	3.115	OVER	OVER	OVER	1.465	0.776	0.363	0.172	0.172
C244	0.074	0.084	0.09	0.093	0.103	0.113	0.127	0.137	0.159	0.191	0.23
245A	0.064	0.095	0.118	0.163	0.229	0.324	0.411	0.438	0.475	0.525	0.57
245B	0.064	0.094	0.119	0.162	0.227	0.321	0.403	0.427	0.466	0.512	0.56
C245	0.052	0.056	0.062	0.066	0.077	0.084	0.096	0.102	0.114	0.137	0.158
246A	1.416	3.36	OVER	OVER	OVER	OVER	1.403	0.81	0.373	0.27	0.244
246B	1.424	3.367	OVER	OVER	OVER	OVER	1.519	1.061	0.38	0.26	0.22
C246	0.1	0.111	0.115	0.12	0.128	0.141	0.155	0.165	0.187	0.235	0.281
247A	0.091	0.12	0.141	0.184	0.25	0.341	0.42	0.445	0.481	0.53	0.582
247B	0.098	0.124	0.147	0.193	0.261	0.355	0.442	0.467	0.308	0.57	0.629
C247	0.075	0.077	0.082	0.087	0.096	0.105	0.114	0.122	0.136	0.157	0.179
248A	1.55	3.451	OVER	OVER	OVER	OVER	1.514	0.788	0.334	0.255	0.222
248B	1.587	OVER	OVER	OVER	OVER	OVER	1.54	0.796	0.346	0.265	0.238
C248	0.127	0.135	0.14	0.15	0.154	0.164	0.181	0.194	0.223	0.266	0.322
249A	0.05	0.07	0.094	0.135	0.21	0.363	0.593	0.69	0.859	0.98	1.031
249B	0.05	0.07	0.093	0.137	0.212	0.37	0.607	0.707	0.881	1.007	1.056
C249	0.04	0.042	0.045	0.048	0.051	0.056	0.06	0.065	0.069	0.083	0.095
250A	0.989	3.436	OVER	OVER	OVER	OVER	OVER	1.194	0.512	0.282	0.198
250B	1.01	over	OVER	OVER	OVER	OVER	OVER	1.248	0.508	0.182	0.181
C250	0.062	0.065	0.068	0.07	0.072	0.076	0.081	0.083	0.094	0.118	0.144
251A	0.088	0.109	0.131	0.178	0.252	0.407	0.62	0.716	0.879	1.009	1.041
251B	0.093	0.114	0.136	0.181	0.26	0.42	0.637	0.729	0.911	1.035	1.072
C251	0.082	0.086	0.088	0.095	0.097	0.1	0.107	0.114	0.117	0.134	0.145
252A	1.222	over	OVER	OVER	OVER	OVER	2.593	1.453	1.249	0.769	1.201
252B	1.21	over	OVER	OVER	OVER	OVER	2.646	1.364	1.226	0.769	0.421
C252	0.102	0.104	0.108	0.111	0.115	0.116	0.125	0.129	0.141	0.163	0.18
253A	0.052	0.073	0.097	0.14	0.215	0.37	0.614	0.724	0.918	1.069	1.129
253B	0.052	0.074	0.098	0.141	0.216	0.377	0.621	0.729	0.923	1.07	1.133
C253	0.049	0.052	0.056	0.061	0.066	0.074	0.084	0.088	0.099	0.122	0.14
254A	1.168	OVER	OVER	OVER	OVER	OVER	OVER	3.281	0.932	0.231	0.198
254B	1.222	OVER	OVER	OVER	OVER	OVER	OVER	3.25	1.156	0.327	0.22
C254	0.066	0.072	0.076	0.082	0.087	0.092	0.105	0.109	0.129	0.163	0.199
255A	0.086	0.106	0.13	0.176	0.252	0.404	0.62	0.714	0.931	1.069	1.115
255B	0.095	0.117	0.141	0.187	0.267	0.433	0.653	0.744	0.934	1.088	1.132
C255	0.083	0.091	0.093	0.097	0.105	0.109	0.123	0.129	0.138	0.164	0.18
256A	1.386	OVER	OVER	OVER	OVER	OVER	OVER	3.217	0.834	0.725	1.103
256B	1.411	OVER	OVER	OVER	OVER	OVER	OVER	3.479	0.797	0.898	0.686
C256	0.106	0.112	0.117	0.123	0.128	0.136	0.151	0.158	0.171	0.216	0.249
257A	0.031	0.038	0.053	0.085	0.142	0.182	0.2	0.202	0.193	0.065	0.028
257B	0.032	0.039	0.054	0.091	0.145	0.187	0.207	0.207	0.192	0.067	0.027
C257	0.029	0.029	0.03	0.032	0.035	0.039	0.048	0.052	0.058	0.045	0.028
258A	0.627	0.902	0.96	0.974	0.956	0.86	0.561	0.304	0.148	0.096	0.091
258B	0.635	0.906	0.973	0.985	0.952	0.869	0.576	0.315	0.153	0.113	0.096
C258	0.044	0.045	0.052	0.058	0.068	0.078	0.079	0.077	0.078	0.072	0.063
259A	0.043	0.05	0.065	0.118	0.178	0.21	0.209	0.176	0.103	0.056	0.028
259B	0.044	0.052	0.07	0.124	0.18	0.211	0.202	0.175	0.106	0.057	0.034
C259	0.04	0.042	0.042	0.044	0.049	0.061	0.088	0.084	0.065	0.051	0.026
260A	0.727	0.962	1.015	1.008	0.96	0.823	0.481	0.284	0.152	0.115	0.118
260B	0.693	0.927	0.979	0.973	0.934	0.836	0.534	0.306	0.151	0.114	0.11
C260	0.057	0.0688	0.084	0.118	0.132	0.13	0.124	0.117	0.104	0.086	0.07
261A	0.03	0.029	0.028	0.028	0.025	0.01	0.006	0.006	0.008	0.01	0.011
261B	0.031	0.03	0.029	0.028	0.027	0.012	0.007	0.008	0.009	0.01	0.012
C261	0.03	0.028	0.028	0.027	0.026	0.011	0.007	0.007	0.009	0.01	0.012
262A	1.493	2.698	3.412	3.432	2.314	1.02	0.562	0.351	0.163	0.072	0.042
262B	1.538	2.741	3.415	3.377	1.681	1.555	0.541	0.351	0.25	0.089	0.063
C262	0.868	1.4	1.8	2.089	1.269	1.272	1.043	0.62	0.344	0.212	0.15
263A	0.062	0.061	0.059	0.057	0.055	0.037	0.03	0.029	0.029	0.029	0.03
263B	0.068	0.066	0.064	0.063	0.062	0.043	0.036	0.033	0.032	0.026	0.028
C263	0.071	0.067	0.067	0.064	0.063	0.044	0.036	0.033	0.03	0.03	0.03
264A	1.528	2.635	3.297	OVER	3.162	1.265	1.833	2.638	2.911	1.251	1.711
264B	1.586	2.706	3.418	OVER	2.275	1.54	2.76	2.934	2.271	1.222	1.482
C264	0.45	0.929	1.308	1.67	2.138	1.135	1.246	0.923	0.659	0.465	0.332
265a	0.048	0.069	0.092	0.137	0.558	0.981	0.821	0.729	0.417	0.113	0.063
265b	0.049	0.07	0.095	0.147	0.482	0.952	0.837	0.732	0.409	0.182	0.098
c265	0.046	0.057	0.065	0.083	0.169	0.864	0.871	0.772	0.503	0.17	0.096
266a	0.844	1.571	1.874	2.051	2.108	1.665	0.576	0.331	0.328	0.107	0.088
266B	0.865	1.643	1.976	2.179	2.253	1.517	0.622	0.328	0.334	0.148	0.113
C266	0.067	0.126	0.293	0.374	0.519	0.726	0.969	0.705	0.386	0.476	0.316
267A	0.094	0.119	0.142	0.181	0.569	0.861	0.61	0.41	0.179	0.059	0.022
267B	0.093	0.119	0.148	0.208	0.603	0.98	0.627	0.451	0.247	0.13	0.099
C267	0.108	0.123	0.138	0.164	0.279	1.072	0.836	0.683	0.391	0.226	0.158
268A	0.89	1.368	1.531	1.606	1.569	1.144	0.499	0.386	0.339	0.173	0.138
268B	0.909	1.42	1.597	1.672	1.596	1.068	0.534	0.328	0.369	0.188	0.135
C268	0.123	0.289	0.382	0.473	0.618	0.709	0.589	0.452	0.411	0.441	0.305
269A	0.066	0.107	0.163	0.508	0.656	0.854	1.067	0.7	0.298	0.088	0.046
269B	0.068	0.11	0.173	0.519	0.663	0.86	1.068	0.723	0.26	0.083	0.031
C269	0.056	0.076	0.101	0.18	0.642	0.788	1.028	0.928	0.317	0.091	0.04

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
270A	1.441	2.183	2.392	2.483	2.475	1.415	0.617	0.442	0.422	0.581	0.529
270B	1.416	2.149	2.359	2.452	2.47	1.406	0.645	0.446	0.416	0.476	0.509
C270	0.12	0.293	0.354	0.443	0.602	0.828	1.104	0.741	0.437	0.491	0.534
271A	0.095	0.133	0.186	0.534	0.763	1.003	0.588	0.433	0.211	0.069	0.027
271B	0.091	0.129	0.185	0.543	0.785	1.033	0.651	0.531	0.21	0.075	0.027
C271	0.105	0.123	0.148	0.189	0.605	0.751	0.667	0.519	0.233	0.09	0.047
272A	1.286	1.577	1.615	1.627	1.533	1.075	0.542	0.406	0.43	0.508	0.608
272B	1.292	1.576	1.628	1.622	1.525	1.102	0.562	0.426	0.445	0.46	0.534
C272	0.191	0.419	0.505	0.622	0.784	0.822	0.666	0.534	0.454	0.495	0.663
273A	0.057	0.107	0.15	0.253	0.714	0.813	0.784	0.705	0.441	0.14	0.043
273B	0.057	0.106	0.149	0.253	0.817	0.875	0.789	0.715	0.44	0.153	0.069
C273	0.046	0.059	0.067	0.091	0.17	1.084	0.717	0.502	0.219	0.12	0.089
274A	1.124	2.256	2.475	2.593	2.591	1.265	0.51	0.296	0.101	0.075	0.039
274B	1.162	2.381	2.639	2.771	2.777	1.255	0.534	0.282	0.131	0.072	0.043
C274	0.062	0.165	0.284	0.352	0.463	0.638	0.865	0.715	0.378	0.453	0.383
275A	0.082	0.127	0.16	0.236	0.77	0.893	0.627	0.441	0.184	0.054	0.027
275B	0.08	0.126	0.16	0.238	0.789	0.912	0.678	0.513	0.234	0.077	0.038
C275	0.07	0.089	0.098	0.116	0.178	0.994	0.866	0.746	0.421	0.181	0.094
276A	1.101	1.646	1.737	1.771	1.715	1.202	0.48	0.341	0.191	0.11	0.078
276B	1.028	1.519	1.602	1.637	1.59	1.198	0.513	0.344	0.17	0.109	0.08
C276	0.094	0.295	0.347	0.428	0.551	0.694	0.625	0.524	0.434	0.434	0.33
277A	0.035	0.032	0.032	0.033	0.034	0.034	0.031		0.025	0.024	0.025
277B	0.035	0.032	0.034	0.033	0.033	0.032	0.031		0.026	0.026	0.025
C277	0.034	0.036	0.032	0.033	0.035	0.033	0.031		0.028	0.025	0.022
278A	0.052	0.056	0.087	0.442	1.119	1.89	1.146		0.081	0.049	0.048
278B	0.056	0.057	0.085	0.423	1.091	1.887	1.155		0.071	0.046	0.047
C278	0.047	0.047	0.047	0.048	0.049	0.048	0.045		0.045	0.043	0.042
279A	0.066	0.062	0.063	0.062	0.063	0.059	0.058		0.041	0.036	0.032
279B	0.068	0.066	0.065	0.065	0.065	0.062	0.055		0.042	0.041	0.047
C279	0.078	0.073	0.072	0.07	0.069	0.065	0.06		0.046	0.041	0.035
280A	0.081	0.086	0.125	0.493	0.977	1.402	1.155		0.196	0.066	0.054
280B	0.082	0.088	0.133	0.51	0.99	1.385	1.115		0.183	0.09	0.052
C280	0.084	0.08	0.077	0.075	0.077	0.072	0.065		0.047	0.043	0.042
281A	0.0343	0.035	0.034	0.035	0.035	0.035	0.033		0.031	0.031	0.031
281B	0.034	0.033	0.034	0.033	0.035	0.034	0.032		0.031	0.031	0.032
C281	0.032	0.031	0.031	0.031	0.031	0.03	0.03		0.028	0.027	0.027
282A	0.092	0.141	0.355	0.971	1.557	2.126	2.33		0.571	0.155	0.095
282B	0.099	0.148	0.372	1.01	1.586	2.203	2.38		0.638	0.169	0.108
C282	0.086	0.086	0.085	0.086	0.086	0.085	0.085		0.085	0.083	0.084
283A	0.086	0.082	0.084	0.082	0.08	0.076	0.07		0.061	0.073	0.104
283B	0.069	0.067	0.067	0.066	0.068	0.062	0.056		0.048	0.044	0.045
C283	0.078	0.074	0.073	0.08	0.071	0.068	0.067		0.051	0.046	0.046
284A	0.127	0.203	0.473	1.015	1.436	1.761	1.928		1.07	0.254	0.137
284B	0.135	0.215	0.48	0.98	1.357	1.625	1.743		1.042	0.228	0.137
C284	0.116	0.114	0.113	0.112	0.111	0.108	0.103		0.087	0.082	0.083
285A	0.012	0.012	0.012	0.014	0.017	0.044	0.087	0.095	0.096	0.051	0.057
285B	0.014	0.014	0.013	0.017	0.019	0.048	0.089	0.094	0.087	0.027	0.022
C285	0.015	0.015	0.015	0.017	0.018	0.019	0.029	0.036	0.049	0.041	0.03
286A	0.111	0.825	1.13	1.191	1.152	1.001	0.342	0.186	0.096	0.066	0.059
286B	0.126	0.843	1.141	1.196	1.155	0.998	0.345	0.18	0.083	0.056	0.05
C286	0.046	0.045	0.046	0.046	0.046	0.048	0.047	0.047	0.05	0.51	0.048
287A	0.059	0.055	0.06	0.061	0.069	0.124	0.169	0.148	0.094	0.037	0.041
287B	0.059	0.057	0.056	0.058	0.075	0.143	0.187	0.162	0.089	0.03	0.035
C287	0.056	0.054	0.053	0.055	0.057	0.079	0.093	0.09	0.065	0.029	0.019
288A	0.182	0.892	1.162	1.206	1.143	0.817	0.329	0.186	0.093	0.078	0.073
288B	0.18	0.886	1.155	1.219	1.169	0.83	0.325	0.174	0.087	0.075	0.099
C288	0.078	0.074	0.075	0.074	0.073	0.075	0.094	0.096	0.086	0.065	0.086
289A	0.019	0.018	0.02	0.023	0.036	0.089	0.127	0.129	0.116	0.04	0.028
289B	0.019	0.019	0.02	0.024	0.037	0.091	0.127	0.129	0.112	0.037	0.029
C289	0.018	0.018	0.02	0.022	0.022	0.027	0.041	0.052	0.061	0.049	0.025
290A	0.414	1.326	1.442	1.424	1.352	1.033	0.361	0.204	0.108	0.083	0.085
290B	0.426	1.342	1.469	1.451	1.377	1.028	0.368	0.207	0.112	0.089	0.086
C290	0.09	0.086	0.086	0.088	0.092	0.088	0.09	0.092	0.102	0.098	0.097
291A	0.065	0.065	0.063	0.07	0.105	0.185	0.201	0.168	0.093	0.039	0.04
291B	0.033	0.032	0.034	0.041	0.067	0.131	0.152	0.142	0.094	0.038	0.033
C291	0.038	0.037	0.037	0.039	0.038	0.048	0.072	0.077	0.073	0.028	0.026
292A	0.536	1.377	1.486	1.459	1.37	0.942	0.356	0.213	0.117	0.093	0.098
292B	0.546	1.37	1.471	1.444	1.348	0.92	0.377	0.227	0.123	0.099	0.106
C292	0.106	0.104	0.103	0.105	0.108	0.12	0.148	0.141	0.123	0.095	0.1
293A	0.021	0.022	0.022	0.023	0.023	0.019	0.016	0.015	0.017	0.023	0.029
293B	0.02	0.022	0.021	0.023	0.023	0.019	0.015	0.015	0.016	0.022	0.029
C293	0.022	0.023	0.021	0.021	0.02	0.019	0.018	0.018	0.016	0.024	0.014
294A	0.055	0.098	0.381	0.99	1.469	1.689	1.416	0.41	0.126	0.15	0.149
294B	0.056	0.096	0.38	0.973	1.453	1.667	1.454	0.413	0.131	0.136	0.129
C294	0.046	0.048	0.046	0.045	0.044	0.044	0.043	0.045	0.044	0.041	0.041
295A	0.064	0.065	0.064	0.062	0.059	0.054	0.048	0.038	0.039	0.045	0.045
295B	0.054	0.053	0.051	0.05	0.048	0.042	0.038	0.031	0.032	0.053	0.062
C295	0.058	0.056	0.055	0.054	0.051	0.048	0.04	0.035	0.031	0.026	0.023
296A	0.086	0.138	0.439	0.922	1.242	1.343	1.086	0.524	0.259	0.161	0.127
296B	0.086	0.135	0.454	1.015	1.423	1.563	1.015	0.289	0.14	0.146	0.131
C296	0.075	0.074	0.073	0.071	0.07	0.067	0.063	0.057	0.049	0.041	0.042
297A	0.022	0.023	0.023	0.035	0.101	0.178	0.198	0.196	0.131	0.048	0.05
297B	0.02	0.022	0.022	0.034	0.1	0.183	0.212	0.214	0.157	0.077	0.084
C297	0.021	0.022	0.022	0.023	0.024	0.028	0.036	0.049	0.065	0.06	0.044
298A	0.56	1.424	1.549	1.609	1.505	0.82	0.35	0.213	0.154	0.134	0.133
298B	0.555	1.421	1.537	1.604	1.508	0.826	0.374	0.223	0.154	0.158	0.123
C298	0.044	0.046	0.045	0.044	0.045	0.045	0.046	0.047	0.049	0.054	0.05

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
299A	0.054	0.054	0.056	0.079	0.166	0.235	0.241	0.2	0.1	0.031	0.03
299B	0.049	0.049	0.049	0.071	0.153	0.219	0.224	0.187	0.1	0.034	0.03
C299	0.057	0.055	0.054	0.054	0.061	0.073	0.084	0.071	0.068	0.025	0.016
300A	0.702	1.46	1.598	1.641	1.419	0.708	0.336	0.199	0.154	0.159	0.136
300B	0.712	1.456	1.586	1.62	1.401	0.697	0.336	0.183	0.122	0.118	0.128
C300	0.074	0.074	0.072	0.072	0.078	0.078	0.105	0.112	0.108	0.099	0.069
301A	0.04	0.048	0.057	0.076	0.118	0.559	0.753	0.703	0.602	0.492	0.434
301B	0.04	0.049	0.058	0.077	0.117	0.56	0.755	0.706	0.605	0.494	0.432
C301	0.039	0.045	0.051	0.059	0.073	0.218	0.556	0.753	0.763	0.623	0.552
302A	0.265	1.716	2.546	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
302B	0.277	1.735	2.584	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C302	0.069	0.088	0.106	0.224	0.531	1.614	OVER	OVER	OVER	OVER	OVER
303A	0.077	0.086	0.095	0.12	0.211	0.621	0.767	0.772	0.719	0.659	0.546
303B	0.076	0.084	0.093	0.118	0.198	0.596	0.757	0.766	0.729	0.631	0.382
C303	0.091	0.092	0.099	0.107	0.134	0.409	0.582	0.741	0.818	0.745	0.698
304A	0.417	1.892	2.722	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
304B	0.376	1.831	2.653	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C304	0.11	0.125	0.145	0.259	0.506	1.358	OVER	OVER	OVER	OVER	OVER
305A	0.049	0.066	0.079	0.133	0.439	0.973	1.495	1.556	1.326	1.117	0.994
305B	0.05	0.067	0.083	0.139	0.466	1.003	1.496	1.558	1.345	1.129	0.998
C305	0.045	0.054	0.062	0.076	0.106	0.484	0.839	1.275	1.588	1.323	1.2
306A	1.033	2.935	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
306B	1.08	2.957	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C306	0.114	0.148	0.205	0.49	0.814	3.091	OVER	OVER	OVER	OVER	OVER
307A	0.099	0.114	0.136	0.281	0.569	0.957	1.322	1.528	1.485	1.305	1.205
307B	0.088	0.101	0.121	0.236	0.538	0.974	1.321	1.528	1.441	1.264	1.151
C307	0.08	0.101	0.102	0.124	0.226	0.512	0.739	0.981	1.544	1.475	1.384
308A	1.322	3.121	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
308B	1.398	3.213	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER	OVER
C308	0.162	0.195	0.266	0.53	0.828	2.568	OVER	OVER	OVER	OVER	OVER
309A	0.032	0.034	0.039	0.05	0.074	0.213	0.574	0.764	0.744	0.549	0.455
309B	0.031	0.034	0.04	0.052	0.077	0.232	0.593	0.77	0.715	0.53	0.426
C309	0.032	0.032	0.033	0.034	0.036	0.038	0.043	0.05	0.214	0.809	0.811
310A	0.344	1.43	2.159	3.338	OVER	OVER	OVER	OVER	2.504	1.849	1.426
310B	0.33	1.43	2.163	3.308	OVER	OVER	1.682	0.863	0.547	0.341	0.259
C310	0.045	0.05	0.05	0.054	0.063	0.087	0.437	1.191	2.887	3.074	2.979
311A	0.044	0.049	0.054	0.067	0.101	0.308	0.587	0.79	0.757	0.585	0.489
311B	0.046	0.048	0.055	0.067	0.103	0.327	0.584	0.775	0.752	0.575	0.492
C311	0.051	0.049	0.056	0.051	0.081	0.072	0.075	0.12	0.368	0.68	0.58
312A	0.427	1.486	2.21	3.287	OVER	OVER	1.039	0.637	0.352	0.21	0.14
312B	0.449	1.49	2.338	3.276	OVER	OVER	1.408	0.762	0.33	0.19	0.128
C312	0.054	0.056	0.061	0.065	0.096	0.196	0.658	1.608	2.897	3.095	3.194
313A	0.05	0.056	0.073	0.101	0.264	0.58	1.045	1.435	1.58	1.263	1.078
313B	0.037	0.044	0.056	0.081	0.238	0.542	0.981	1.374	1.624	1.281	1.096
C313	0.034	0.035	0.04	0.038	0.04	0.044	0.052	0.084	0.354	1.281	1.614
314A	1.17	2.303	2.526	3.38	OVER	OVER	1.25	0.968	0.6	0.575	0.515
314B	1.196	2.373	2.568	3.479	OVER	OVER	1.488	0.985	0.571	0.482	0.406
C314	0.086	0.088	0.092	0.099	0.121	0.328	1.263	3.148	1.641	0.494	0.456
315A	0.05	0.059	0.072	0.106	0.324	0.593	0.981	1.341	1.529	1.228	1.038
315B	0.059	0.072	0.08	0.13	0.343	0.605	0.989	1.297	1.518	1.253	1.041
C315	0.049	0.049	0.052	0.053	0.055	0.061	0.135	0.262	0.582	1.486	1.383
316A	1.308	2.353	2.647	3.325	OVER	OVER	1.171	1.009	0.66	0.772	0.557
316B	1.319	2.322	2.566	OVER	OVER	OVER	1.31	0.863	0.559	0.594	0.564
C316	0.117	0.114	0.122	0.135	0.208	0.448	1.6	OVER	1.588	0.478	0.551
317A	0.036	0.05	0.062	0.087	0.175	0.564	0.587	0.539	0.469	0.375	0.312
317B	0.047	0.076	0.086	0.116	0.214	0.603	0.668	0.575	0.5	0.356	0.339
C317	0.038	0.044	0.05	0.057	0.069	0.127	0.607	0.789	0.703	0.552	0.469
318A	0.339	2.532	3.264	OVER	OVER	OVER	OVER	OVER	3.057	2.963	2.899
318B	0.353	2.543	3.272	OVER	OVER	OVER	OVER	OVER	2.992	2.989	2.904
C318	0.057	0.078	0.099	0.17	0.527	1.289	OVER	OVER	3.064	3.184	3.39
319A	0.063	0.081	0.087	0.12	0.245	0.607	0.66	0.609	0.52	0.448	0.386
319B	0.061	0.073	0.085	0.111	0.216	0.613	0.624	0.566	0.472	0.265	0.111
C319	0.082	0.066	0.077	0.106	0.097	0.188	0.737	0.754	0.267	0.583	0.567
320A	0.45	2.643	3.256	OVER	OVER	OVER	OVER	OVER	3.044	3.048	3
320B	0.471	2.631	3.266	OVER	OVER	OVER	OVER	OVER	3.017	3.055	3.047
C320	0.083	0.103	0.129	0.238	0.578	1.342	OVER	OVER	3.137	3.269	3.445
321A	0.033	0.046	0.052	0.074	0.153	0.509	0.801	0.691	0.609	0.477	0.393
321B	0.032	0.042	0.052	0.074	0.148	0.499	0.797	0.692	0.607	0.477	0.394
C321	0.03	0.032	0.032	0.033	0.034	0.037	0.042	0.048	0.217	0.758	0.826
322A	1.08	2.871	3.273	OVER	OVER	0.895	0.499	0.38	0.247	0.149	0.098
322B	1.075	2.848	3.29	OVER	OVER	1.77	0.26	0.222	0.121	0.083	0.06
C322	0.066	0.064	0.064	0.083	0.068	0.12	0.837	1.85	3.095	3.218	3.393
323A	0.056	0.063	0.077	0.107	0.221	0.565	0.762	0.718	0.662	0.478	0.451
323B	0.056	0.066	0.078	0.106	0.231	0.552	0.769	0.713	0.657	0.54	0.433
C323	0.055	0.058	0.057	0.058	0.039	0.061	0.094	0.222	0.461	0.792	0.72
324A	1.273	2.836	3.255	OVER	OVER	OVER	0.272	0.177	0.136	0.081	0.05
324B	1.276	2.839	3.313	OVER	OVER	0.928	0.325	0.287	0.156	0.101	0.07
C324	0.064	0.071	0.071	0.078	0.095	0.21	0.892	2.394	3.072	3.319	2.421
325A	0.043	0.05	0.073	0.147	0.231	0.356	0.491	0.565	0.695	0.814	0.709
325B	0.045	0.056	0.084	0.164	0.252	0.381	0.508	0.59	0.726	0.873	0.92
C325	0.041	0.04	0.043	0.043	0.046	0.053	0.089	0.098	0.121	0.204	0.305
326A	0.798	2.07	2.769	3.479	OVER	OVER	3.049	1.42	0.366	0.211	0.133
326B	0.804	2.071	2.749	3.438	OVER	OVER	2.95	1.17	0.366	0.161	0.135
C326	0.049	0.053	0.063	0.085	0.097	0.113	0.142	0.171	0.272	0.589	0.709
327A	0.067	0.083	0.117	0.199	0.286	0.405	0.521	0.617	0.765	0.893	0.899
327B	0.07	0.09	0.127	0.213	0.298	0.414	0.538	0.636	0.777	0.901	0.903
C327	0.065	0.065	0.068	0.073	0.085	0.143	0.169	0.157	0.204	0.312	0.419

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
328A	0.918	2.18	2.838	OVER	OVER	OVER	OVER	2.252	0.479	0.199	0.158
328B	0.94	2.225	2.908	OVER	OVER	OVER	OVER	3.27	0.576	0.24	0.195
C328	0.068	0.083	0.114	0.127	0.145	0.168	0.21	0.248	0.381	0.675	0.744
329A	0.056	0.104	0.178	0.258	0.379	0.513	0.629	..706	0.818	0.942	0.806
329B	0.063	0.111	0.185	0.264	0.387	0.524	0.634	0.719	0.836	0.973	0.925
C329	0.053	0.051	0.062	0.06	0.071	0.102	0.127	0.137	0.163	0.266	0.369
330A	1.577	2.892	3.223	OVER	OVER	OVER	3.28	1.601	0.441	0.195	0.186
330B	1.604	2.9	3.32	OVER	OVER	OVER	3.498	1.585	0.507	0.238	0.2
C330	0.094	0.106	0.126	0.136	0.143	0.165	0.203	0.25	0.393	0.744	0.416
331A	0.09	0.149	0.229	0.312	0.43	0.568	0.687	0.766	0.889	0.973	0.519
331B	0.079	0.137	0.216	0.296	0.417	0.554	0.669	0.749	0.871	0.973	0.634
C331	0.071	0.075	0.081	0.09	0.119	0.146	0.173	0.184	0.232	0.346	0.464
332A	1.746	2.927	3.361	OVER	OVER	OVER	3.204	1.334	0.471	0.213	0.176
332B	1.774	2.961	3.396	OVER	OVER	oVER	3.364	1.734	0.45	0.225	0.188
C332	0.115	0.151	0.165	0.178	0.199	0.227	0.277	0.333	0.509	0.84	0.332
333A	0.051	0.068	0.086	0.189	0.269	0.386	0.55	0.656	0.871	1.01	0.877
333B	0.052	0.065	0.081	0.163	0.253	0.37	0.524	0.631	0.845	1.009	0.871
C333	0.051	0.056	0.057	0.062	0.072	0.144	0.172	0.196	0.263	0.441	0.61
334A	0.638	1.8	2.188	2.613	2.724	1.077	0.589	0.526	0.179	0.128	0.115
334B	0.66	1.928	2.41	3.015	3.28	1.669	0.727	0.42	0.215	0.116	0.12
C334	0.073	0.071	0.075	0.084	0.112	0.124	0.158	0.225	0.476	0.237	0.164
335A	0.083	0.109	0.138	0.243	0.331	0.445	0.586	0.692	0.871	1.008	0.911
335B	0.083	0.103	0.124	0.214	0.3	0.412	0.544	0.638	0.831	0.978	0.871
C335	0.08	0.084	0.087	0.092	0.106	0.174	0.203	0.216	0.279	0.442	0.584
336A	0.694	1.746	2.132	2.457	1.626	1.139	0.602	0.402	0.171	0.133	0.141
336B	0.784	2.091	2.627	3.431	OVER	OVER	1.52	0.989	0.571	0.186	0.144
C336	0.086	0.101	0.125	0.146	0.168	0.201	0.278	0.379	0.708	0.412	0.18
337A	0.072	0.135	0.208	0.293	0.411	0.556	0.728	0.861	1.145	1.631	1.782
337B	0.075	0.144	0.217	0.301	0.418	0.559	0.733	0.861	1.137	1.606	1.8
C337	0.065	0.075	0.071	0.071	0.081	0.127	0.158	0.174	0.229	0.367	0.514
338A	1.306	2.825	3.286	OVER	OVER	2.306	0.833	0.627	0.297	0.18	0.189
338B	1.234	2.444	2.722	2.928	2.872	1.071	0.699	0.463	0.256	0.185	0.175
C338	0.106	0.122	0.134	0.147	0.163	0.195	0.267	0.382	0.907	0.346	0.228
339A	0.113	0.202	0.275	0.362	0.477	0.619	0.777	0.897	1.15	1.522	1.62
339B	0.115	0.22	0.29	0.378	0.503	0.65	0.818	0.959	1.199	1.584	1.753
C339	0.104	0.121	0.139	0.211	0.243	0.27	0.326	0.372	0.469	0.656	0.807
340A	1.578	3.329	OVER	OVER	OVER	OVER	OVER	OVER	0.742	0.378	0.282
340B	1.603	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.952	0.353	0.262
C340	0.173	0.226	0.24	0.266	0.306	0.376	0.521	0.7	1.4	0.669	0.306
341A	0.059	0.121	0.209	0.3	0.455	0.65	0.883	0.966	1.113	0.986	0.883
341B	0.056	0.105	0.191	0.282	0.434	0.627	0.859	0.942	1.091	0.963	0.823
C341	0.051	0.057	0.06	0.065	0.097	0.135	0.154	0.166	0.211	0.309	0.424
342A	1.311	OVER	OVER	OVER	OVER	1.207	0.558	0.384	0.132	0.114	0.131
342B	1.412	OVER	OVER	OVER	OVER	1.396	0.656	0.466	0.151	0.108	0.109
C342	0.05	0.058	0.072	0.089	0.099	0.113	0.164	0.156	0.133	0.144	0.11
343A	0.082	0.136	0.221	0.307	0.446	0.607	0.78	0.835	0.902	0.78	0.509
343B	0.078	0.13	0.211	0.299	0.439	0.606	0.777	0.84	0.954	0.771	0.532
C343	0.074	0.079	0.086	0.116	0.153	0.171	0.202	0.221	0.292	0.447	0.568
344A	1.523	OVER	OVER	OVER	OVER	1.354	0.775	0.642	0.316	0.315	0.235
344B	1.504	OVER	OVER	OVER	OVER	1.379	0.948	0.718	0.352	0.249	0.166
C344	0.075	0.115	0.132	0.144	0.164	0.192	0.235	0.257	0.26	0.213	0.152
345A	0.088	0.171	0.288	0.388	0.539	0.737	0.968	1.053	1.04	0.918	0.842
345B	0.063	0.104	0.192	0.286	0.435	0.642	0.871	0.964	1.049	0.902	0.79
C345	0.043	0.048	0.049	0.053	0.063	0.084	0.125	0.134	0.175	0.284	0.421
346A	1.393	3.294	OVER	OVER	3.014	1.178	0.616	0.392	0.167	0.116	0.18
346B	1.338	2.979	OVER	OVER	2.209	1.153	0.568	0.405	0.159	0.117	0.156
C346	0.058	0.082	0.11	0.121	0.141	0.175	0.26	0.321	0.615	0.437	0.265
347A	0.091	0.142	0.23	0.329	0.466	0.629	0.811	0.957	0.975	0.815	0.659
347B	0.112	0.164	0.254	0.349	0.484	0.647	0.837	0.935	1.019	0.94	0.852
C347	0.124	0.126	0.13	0.158	0.223	0.241	0.29	0.308	0.386	0.547	0.658
348A	1.784	OVER	OVER	OVER	OVER	OVER	OVER	2.21	0.93	0.357	0.234
348B	1.716	OVER	OVER	OVER	OVER	2.363	1.346	1.088	OVER	0.981	0.401
C348	0.101	0.168	0.187	0.209	0.246	0.312	0.429	0.516	0.897	0.58	0.337
349A	0.038	0.05	0.061	0.077	0.105	0.146	0.179	0.188	0.18	0.094	0.064
349B	0.037	0.048	0.06	0.074	0.101	0.142	0.175	0.183	0.178	0.08	0.046
C349	0.033	0.036	0.039	0.04	0.043	0.046	0.05	0.05	0.049	0.047	0.042
350A	0.5	0.821	0.873	0.894	0.81	0.805	0.539	0.317	0.165	0.119	0.116
350B	0.508	0.83	0.882	0.899	0.874	0.806	0.542	0.281	0.184	0.138	0.131
C350	0.055	0.061	0.064	0.064	0.064	0.066	0.068	0.067	0.066	0.068	0.069
351A	0.067	0.08	0.09	0.105	0.134	0.168	0.177	0.152	0.095	0.036	0.036
351B	0.073	0.085	0.098	0.113	0.141	0.174	0.177	0.133	0.089	0.044	0.034
C351	0.074	0.074	0.079	0.077	0.081	0.078	0.07	0.055	0.041	0.032	0.03
352A	0.576	0.86	0.908	0.916	0.879	0.778	0.461	0.316	0.177	0.132	0.131
352B	0.584	0.869	0.919	0.924	0.891	0.772	0.451	0.304	0.163	0.128	0.129
C352	0.087	0.091	0.095	0.093	0.093	0.092	0.09	0.076	0.069	0.064	0.062
353A	0.245	0.339	0.39	0.446	0.513	0.586	0.419	0.27	0.189	0.074	0.046
353B	0.257	0.362	0.412	0.471	0.541	0.607	0.348	0.272	0.165	0.075	0.049
C353	0.241	0.358	0.404	0.457	0.516	0.569	0.35	0.244	0.192	0.118	0.063
354A	0.831	2.079	2.755	3.441	1.652	1.339	1.192	1.139	1.1	1.108	1.085
354B	0.851	2.066	2.726	3.414	1.727	1.332	1.12	1.015	0.963	0.908	0.86
C354	0.412	0.596	0.69	0.799	0.943	1.146	1.396	1.551	1.889	2.423	2.785
355A	0.314	0.413	0.46	0.512	0.569	0.525	0.275	0.228	0.146	0.073	0.049
355B	0.271	0.376	0.423	0.481	0.548	0.594	0.513	0.392	0.267	0.129	0.076
C355	0.304	0.388	0.427	0.473	0.521	0.522	0.281	0.237	0.198	0.149	0.101
356A	0.963	2.103	2.749	3.348	1.713	1.542	1.174	1.249	1.148	1.139	0.932
356B	0.967	2.108	2.77	3.142	1.551	1.22	0.957	0.925	0.908	0.886	0.793
C356	0.414	0.572	0.65	0.737	0.861	1.018	1.238	1.392	1.786	1.857	1.675

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
357A	0.063	0.091	0.106	0.128	0.168	0.23	0.322	0.375	0.455	0.516	0.565
357B	0.069	0.1	0.117	0.141	0.184	0.25	0.349	0.406	0.498	0.572	0.633
C357	0.065	0.087	0.098	0.109	0.124	0.146	0.175	0.19	0.222	0.264	0.305
358A	0.559	1.451	1.851	2.091	2.208	2.147	0.824	0.448	0.484	0.532	0.525
358B	0.573	1.428	1.796	2.025	2.128	2.053	0.752	0.437	0.436	0.517	0.509
C358	0.092	0.12	0.133	0.15	0.172	0.201	0.24	0.263	0.318	0.386	0.308
359A	0.116	0.152	0.169	0.194	0.238	0.304	0.403	0.464	0.565	0.654	0.681
359B	0.127	0.161	0.178	0.202	0.247	0.312	0.412	0.47	0.57	0.665	0.703
C359	0.104	0.132	0.145	0.155	0.173	0.196	0.227	0.245	0.283	0.336	0.353
360A	0.628	1.286	1.496	1.604	1.587	1.407	0.79	0.5	0.46	0.592	0.556
360B	0.629	1.285	1.502	1.601	1.602	1.474	0.79	0.457	0.398	0.488	0.465
C360	0.115	0.143	0.157	0.171	0.19	0.218	0.253	0.268	0.32	0.304	0.286
361A	0.088	0.121	0.144	0.179	0.245	0.33	0.427	0.471	0.53	0.617	0.693
361B	0.083	0.117	0.141	0.178	0.245	0.333	0.434	0.478	0.546	0.623	0.699
C361	0.077	0.097	0.106	0.119	0.139	0.161	0.187	0.201	0.236	0.291	0.345
362A	1.119	2.012	2.24	2.341	2.349	2.014	0.738	0.46	0.446	0.461	0.565
362B	1.092	2.118	2.406	2.543	2.594	1.841	0.791	0.471	0.469	0.525	0.612
C362	0.146	0.17	0.18	0.196	0.221	0.255	0.298	0.327	0.406	0.431	0.359
363A	0.123	0.161	0.185	0.224	0.289	0.376	0.473	0.517	0.593	0.671	0.743
363B	0.138	0.178	0.205	0.246	0.321	0.418	0.531	0.583	0.67	0.778	0.828
C363	0.114	0.138	0.148	0.162	0.184	0.209	0.235	0.251	0.29	0.337	0.394
364A	1.116	1.778	1.909	1.94	1.867	1.335	0.668	0.433	0.383	0.464	0.477
364B	1.12	1.762	1.869	1.886	1.815	1.475	0.758	0.484	0.47	0.573	0.544
C364	0.174	0.202	0.214	0.227	0.249	0.282	0.324	0.351	0.403	0.391	0.365
365A	0.09	0.133	0.156	0.194	0.261	0.375	0.553	0.638	0.837	1.013	1.171
365B	0.09	0.128	0.153	0.191	0.255	0.366	0.542	0.623	0.806	0.984	1.138
C365	0.082	0.104	0.111	0.122	0.136	0.152	0.178	0.189	0.218	0.262	0.302
366A	1.052	2.441	2.762	2.948	2.949	1.252	0.578	0.353	0.23	0.155	0.121
366B	1.03	2.399	2.72	2.914	2.939	1.262	0.549	0.326	0.187	0.112	0.089
C366	0.093	0.118	0.13	0.145	0.165	0.19	0.227	0.241	0.29	0.37	0.33
367A	0.122	0.172	0.197	0.237	0.305	0.419	0.6	0.68	0.858	1.045	1.14
367B	0.127	0.175	0.2	0.24	0.306	0.418	0.594	0.67	0.841	1.005	1.12
C367	0.111	0.135	0.144	0.155	0.169	0.187	0.204	0.215	0.247	0.288	0.316
368A	1.109	1.972	2.125	2.169	2.051	1.317	0.537	0.334	0.198	0.138	0.111
368B	1.118	2.007	2.166	2.257	2.156	1.226	0.549	0.347	0.198	0.143	0.118
C368	0.13	0.16	0.173	0.187	0.203	0.229	0.265	0.276	0.318	0.32	0.321
369A	0.033	0.036	0.035	0.037	0.037	0.045	0.091	0.143	0.179	0.186	0.19
369B	0.035	0.034	0.036	0.038	0.039	0.052	0.092	0.143	0.179	0.187	0.188
C369	0.035	0.036	0.035	0.036	0.036	0.04	0.045	0.048	0.06	0.079	0.096
370A	0.19	0.557	0.898	1.29	1.631	1.872	2.035	2.114	1.882	0.164	0.105
370B	0.203	0.574	0.913	1.302	1.637	1.821	2.06	2.138	1.671	0.139	0.086
C370	0.06	0.067	0.07	0.075	0.077	0.082	0.083	0.08	0.078	0.075	0.069
371A	0.077	0.077	0.076	0.078	0.078	0.085	0.158	0.19	0.232	0.254	0.254
371B	0.082	0.083	0.083	0.083	0.083	0.093	0.167	0.197	0.24	0.258	0.264
C371	0.092	0.089	0.088	0.082	0.088	0.09	0.095	0.098	0.136	0.173	0.193
372A	0.242	0.603	0.926	1.305	1.63	1.864	2.025	2.089	1.684	0.155	0.101
372B	0.258	0.619	0.941	1.302	1.618	1.843	2	2.044	1.13	0.145	0.102
C372	0.1	0.102	0.105	0.11	0.109	0.108	0.104	0.098	0.074	0.069	0.062
373A	0.03	0.033	0.032	0.036	0.039	0.06	0.13	0.152	0.163	0.163	0.166
373B	0.031	0.033	0.034	0.037	0.042	0.062	0.134	0.155	0.168	0.169	0.171
C373	0.031	0.032	0.032	0.033	0.039	0.037	0.043	0.049	0.068	0.095	0.105
374A	0.391	1.015	1.368	1.651	1.863	2.02	2.114	2.129	0.844	0.197	0.181
374B	0.403	1.017	1.365	1.647	1.859	2.021	2.105	2.119	1.299	0.205	0.179
C374	0.105	0.113	0.116	0.121	0.12	0.127	0.128	0.126	0.125	0.123	0.121
375A	0.09	0.099	0.085	0.088	0.09	0.123	0.201	0.202	0.221	0.23	0.248
375B	0.086	0.088	0.087	0.09	0.092	0.118	0.194	0.214	0.232	0.25	0.267
C375	0.087	0.087	0.086	0.086	0.086	0.09	0.094	0.104	0.138	0.177	0.179
376A	0.464	1.063	1.396	1.671	1.875	2.024	2.092	2.102	0.785	0.143	0.139
376B	0.499	1.088	1.409	1.664	1.856	1.994	2.062	2.067	0.746	0.253	0.258
C376	0.164	0.167	0.172	0.177	0.178	0.18	0.173	0.161	0.133	0.129	0.128
377A	0.016	0.023	0.03	0.042	0.058	0.096	0.155	0.185	0.225	0.249	0.251
377B	0.018	0.023	0.031	0.041	0.055	0.093	0.15	0.181	0.22	0.244	0.258
C377	0.015	0.02	0.023	0.03	0.034	0.04	0.044	0.045	0.05	0.052	0.055
378A	0.297	0.754	1.024	1.076	0.967	0.819	0.33	0.21	0.114	0.097	0.113
378B	0.295	0.753	1.023	1.069	0.972	0.834	0.337	0.227	0.14	0.118	0.119
C378	0.052	0.057	0.059	0.063	0.065	0.067	0.067	0.066	0.064	0.061	0.055
379A	0.051	0.059	0.066	0.076	0.091	0.128	0.181	0.207	0.244	0.24	0.158
379B	0.059	0.065	0.073	0.084	0.1	0.137	0.193	0.219	0.258	0.253	0.139
C379	0.073	0.078	0.08	0.085	0.09	0.093	0.096	0.091	0.066	0.041	0.033
380A	0.36	0.786	1.017	1.08	0.982	0.664	0.304	0.21	0.147	0.112	0.113
380B	0.367	0.779	0.987	1.056	0.965	0.635	0.298	0.213	0.154	0.118	0.116
C380	0.104	0.109	0.115	0.115	0.116	0.111	0.1	0.09	0.072	0.064	0.064
381A	0.025	0.035	0.042	0.057	0.091	0.149	0.205	0.224	0.247	0.264	0.259
381B	0.025	0.037	0.044	0.059	0.094	0.152	0.2008	0.227	0.25	0.268	0.256
C381	0.026	0.031	0.035	0.041	0.047	0.051	0.055	0.054	0.057	0.062	0.066
382A	0.639	1.171	1.247	1.236	1.148	0.801	0.32	0.206	0.118	0.1	0.104
382B	0.654	1.212	1.283	1.263	1.172	0.814	0.339	0.221	0.12	0.097	0.099
C382	0.092	0.097	0.099	0.102	0.104	0.106	0.106	0.106	0.104	0.102	0.09
383A	0.076	0.086	0.092	0.106	0.139	0.193	0.244	0.26	0.28	0.272	0.133
383B	0.076	0.088	0.096	0.112	0.149	0.208	0.255	0.27	0.291	0.254	0.13
C383	0.073	0.076	0.081	0.085	0.088	0.093	0.093	0.094	0.086	0.064	0.058
384A	0.75	1.228	1.325	1.309	1.162	0.663	0.315	0.209	0.123	0.108	0.116
384B	0.745	1.239	1.335	1.319	1.186	0.694	0.371	0.214	0.129	0.111	0.12
C384	0.131	0.136	0.137	0.139	0.139	0.138	0.13	0.122	0.101	0.098	0.094
385A	0.021	0.024	0.024	0.033	0.034	0.049	0.112	0.166	0.198	0.208	0.212
385B	0.019	0.021	0.024	0.035	0.031	0.047	0.107	0.162	0.196	0.206	0.208
C385	0.019	0.02	0.02	0.027	0.021	0.023	0.025	0.029	0.038	0.055	0.074

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
386A	0.254	1.031	1.649	2.185	3.108	OVER	3.438	2.796	2.225	1.727	1.102
386B	0.23	1.018	1.637	2.182	3.113	OVER	OVER	3.179	2.564	1.871	1.191
C386	0.062	0.064	0.065	0.072	0.063	0.063	0.061	0.062	0.061	0.061	0.06
387A	0.063	0.063	0.064	0.069	0.072	0.083	0.156	0.202	0.23	0.234	0.235
387B	0.067	0.067	0.068	0.071	0.075	0.094	0.159	0.206	0.232	0.238	0.238
C387	0.057	0.056	0.056	0.058	0.055	0.056	0.058	0.065	0.086	0.099	0.14
388A	0.28	1.108	1.706	2.24	3.146	OVER	2.786	1.522	0.943	0.624	0.41
388B	0.277	1.11	1.705	2.24	3.183	OVER	1.994	0.752	0.438	0.291	0.232
C388	0.11	0.111	0.11	0.112	0.111	0.108	0.103	0.092	0.078	0.077	0.079
389A	0.023	0.033	0.043	0.058	0.102	0.189	0.31	0.394	0.398	0.179	0.148
389B	0.022	0.032	0.042	0.055	0.097	0.18	0.302	0.38	0.444	0.279	0.144
C389	0.026	0.027	0.032	0.038	0.04	0.044	0.048	0.05	0.05	0.047	0.041
390A	0.717	1.443	1.672	1.666	1.54	0.826	0.341	0.229	0.18	0.191	0.185
390B	0.727	1.487	1.688	1.675	1.543	0.855	0.337	0.199	0.186	0.196	0.167
C390	0.05	0.056	0.057	0.06	0.061	0.062	0.062	0.063	0.06	0.062	0.058
391A	0.085	0.094	0.104	0.118	0.161	0.233	0.332	0.394	0.201	0.097	0.07
391B	0.071	0.083	0.093	0.108	0.155	0.236	0.35	0.405	0.198	0.087	0.075
C391	0.063	0.066	0.069	0.072	0.075	0.078	0.077	0.077	0.053	0.033	0.03
392A	0.794	1.45	1.664	1.649	1.431	0.706	0.297	0.207	0.152	0.151	0.185
392B	0.78	1.43	1.656	1.638	1.404	0.704	0.332	0.19	0.174	0.2	0.195
C392	0.102	0.102	0.105	0.103	0.104	0.102	0.091	0.074	0.063	0.058	0.062
393A	0.04	0.137	0.198	0.267	0.359	0.542	0.787	0.887	0.936	0.835	0.781
393B	0.04	0.135	0.199	0.269	0.366	0.548	0.796	0.9	0.938	0.836	0.779
C393	0.039	0.121	0.17	0.208	0.253	0.337	0.469	0.549	0.786	1.018	0.905
394A	0.491	1.658	2.492	OVER	OVER	OVER	OVER	OVER	3.176	3.393	OVER
394B	0.508	1.675	2.525	OVER	OVER	OVER	OVER	OVER	3.195	3.372	OVER
C394	0.089	0.177	0.214	0.283	0.395	0.632	1.177	1.565	2.939	3.369	OVER
395A	0.086	0.196	0.24	0.305	0.402	0.568	0.79	0.896	0.911	0.821	0.762
395B	0.085	0.197	0.241	0.304	0.399	0.558	0.775	0.856	0.9	0.803	0.754
C395	0.111	0.208	0.236	0.274	0.318	0.392	0.511	0.575	0.763	0.983	0.863
396A	0.604	1.75	2.561	OVER	OVER	OVER	OVER	OVER	3.217	3.372	OVER
396B	0.624	1.764	2.581	OVER	OVER	OVER	OVER	OVER	3.227	3.332	OVER
C396	0.152	0.223	0.258	0.328	0.429	0.682	1.175	1.502	2.734	3.45	OVER
397A	0.073	0.202	0.258	0.362	0.523	0.811	1.224	1.416	1.806	1.653	1.522
397B	0.072	0.203	0.26	0.366	0.529	0.822	1.242	1.443	1.835	1.662	1.55
C397	0.067	0.161	0.185	0.227	0.282	0.383	0.565	0.665	1.011	1.551	1.898
398A	1.11	2.69	3.146	OVER	OVER	OVER	OVER	OVER	3.254	3.452	OVER
398B	1.114	2.704	3.249	OVER	OVER	OVER	OVER	OVER	3.287	3.455	OVER
C398	0.181	0.248	0.296	0.39	0.553	0.923	1.759	2.326	3.198	3.436	OVER
399A	0.155	0.265	0.319	0.421	0.584	0.858	1.21	1.398	1.776	1.635	1.513
399B	0.147	0.256	0.313	0.414	0.578	0.86	1.224	1.39	1.773	1.619	1.479
C399	0.134	0.219	0.242	0.282	0.341	0.448	0.624	0.721	1.038	1.553	1.812
400A	1.28	2.799	3.244	OVER	OVER	OVER	OVER	OVER	3.269	3.412	OVER
400B	1.287	2.812	3.307	OVER	OVER	OVER	OVER	OVER	3.11	3.469	OVER
C400	0.247	0.316	0.365	0.456	0.604	0.947	1.668	2.196	3.155	3.428	OVER
401A	0.039	0.05	0.061	0.084	0.124	0.205	0.337	0.426	0.606	0.865	0.961
401B	0.039	0.052	0.068	0.09	0.13	0.209	0.341	0.43	0.606	0.863	0.953
C401	0.034	0.039	0.042	0.045	0.05	0.058	0.069	0.075	0.089	0.134	0.184
402A	0.439	1.522	2.416	OVER	OVER	OVER	OVER	OVER	3.255	OVER	2.957
402B	0.442	1.532	2.418	OVER	OVER	OVER	OVER	OVER	3.286	OVER	2.737
C402	0.057	0.062	0.068	0.075	0.083	0.104	0.145	0.177	0.284	0.687	1.268
403A	0.076	0.091	0.099	0.12	0.171	0.243	0.374	0.447	0.635	0.839	0.855
403B	0.071	0.081	0.093	0.114	0.153	0.231	0.349	0.419	0.582	0.808	0.863
C403	0.064	0.069	0.073	0.075	0.078	0.086	0.097	0.102	0.121	0.173	0.24
404A	0.515	1.589	2.452	OVER	OVER	OVER	OVER	OVER	3.49	OVER	3.012
404B	0.531	1.621	2.467	OVER	OVER	OVER	OVER	OVER	3.387	OVER	3.01
C404	0.079	0.085	0.089	0.097	0.106	0.131	0.174	0.206	0.328	0.72	1.215
405A	0.049	0.068	0.085	0.122	0.183	0.288	0.443	0.524	0.676	0.968	1.194
405B	0.051	0.071	0.091	0.133	0.214	0.354	0.529	0.641	0.834	1.195	1.45
C405	0.044	0.048	0.05	0.055	0.059	0.067	0.079	0.087	0.105	0.16	0.221
406A	0.959	2.537	3.136	OVER	OVER	OVER	OVER	OVER	0.745	0.511	0.602
406B	0.967	2.56	3.267	OVER	OVER	OVER	OVER	OVER	0.714	0.466	0.506
C406	0.098	0.104	0.111	0.122	0.137	0.173	0.236	0.302	0.513	1.275	2.114
407A	0.084	0.101	0.122	0.164	0.238	0.357	0.51	0.614	0.802	1.149	1.407
407B	0.085	0.101	0.122	0.165	0.242	0.37	0.52	0.621	0.808	1.155	1.436
C407	0.074	0.076	0.079	0.084	0.09	0.099	0.107	0.114	0.134	0.197	0.269
408A	1.125	2.612	3.22	OVER	OVER	OVER	OVER	OVER	0.933	0.493	0.554
408B	1.108	2.642	3.222	OVER	OVER	OVER	OVER	OVER	0.788	0.465	0.511
C408	0.127	0.133	0.138	0.148	0.164	0.196	0.257	0.32	0.537	1.248	2.044
409A	0.043	0.135	0.22	0.302	0.437	0.677	0.906	0.963	0.859	0.77	0.728
409B	0.04	0.125	0.229	0.315	0.453	0.702	0.92	0.957	0.853	0.767	0.726
C409	0.04	0.095	0.162	0.201	0.247	0.334	0.452	0.571	0.81	1.003	0.912
410A	0.85	2.774	OVER	OVER	OVER	OVER	OVER	OVER	OVER	2.982	3.166
410B	0.863	2.763	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.004	3.134
C410	0.09	0.168	0.207	0.269	0.376	0.622	1.078	1.709	3.333	3.008	3.103
411A	0.07	0.176	0.254	0.334	0.47	0.688	0.884	0.938	0.845	0.773	0.72
411B	0.086	0.194	0.263	0.345	0.471	0.691	0.879	0.933	0.861	0.785	0.716
C411	0.095	0.177	0.225	0.259	0.304	0.387	0.495	0.592	0.823	0.92	0.873
412A	1.003	2.857	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.004	3.155
412B	1.011	2.82	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.044	3.134
C412	0.113	0.197	0.236	0.3	0.411	0.683	1.21	1.796	OVER	3.116	3.176
413A	0.05	0.065	0.089	0.129	0.212	0.411	0.654	0.821	0.942	0.821	0.783
413B	0.044	0.062	0.079	0.112	0.185	0.367	0.596	0.763	0.934	0.807	0.77
C413	0.036	0.041	0.043	0.048	0.053	0.062	0.073	0.084	0.101	0.137	0.172
414A	0.906	2.785	3.472	OVER	OVER	OVER	OVER	OVER	OVER	3.02	3.203
414B	0.895	2.793	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.057	3.233
C414	0.056	0.06	0.064	0.071	0.081	0.107	0.142	0.184	0.31	0.645	1.02

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
415A	0.084	0.099	0.119	0.158	0.237	0.405	0.605	0.735	0.894	0.794	0.722
415B	0.082	0.098	0.118	0.158	0.243	0.415	0.6	0.738	0.858	0.788	0.728
C415	0.067	0.069	0.069	0.074	0.077	0.086	0.096	0.098	0.112	0.146	0.181
416A	1.074	2.9	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.085	3.414
416B	1.09	2.987	OVER	OVER	OVER	OVER	OVER	OVER	OVER	3.093	3.385
C416	0.079	0.083	0.087	0.094	0.106	0.126	0.168	0.21	0.342	0.687	1.085
417A	0.048	0.061	0.07	0.096	0.135	0.205	0.305	0.371	0.427	0.474	0.516
417B	0.047	0.06	0.071	0.095	0.134	0.205	0.308	0.37	0.428	0.475	0.518
C417	0.042	0.043	0.043	0.046	0.049	0.052	0.059	0.062	0.067	0.079	0.093
418A	0.675	1.94	2.749	OVER	OVER	OVER	OVER	1.003	0.402	0.239	0.182
418B	0.695	1.978	2.796	OVER	OVER	OVER	OVER	0.999	0.411	0.224	0.176
C418	0.054	0.058	0.06	0.062	0.065	0.068	0.076	0.083	0.094	0.127	0.168
419A	0.078	0.099	0.104	0.127	0.166	0.242	0.35	0.407	0.478	0.53	0.579
419B	0.077	0.09	0.101	0.126	0.165	0.239	0.34	0.395	0.462	0.517	0.561
C419	0.087	0.087	0.087	0.091	0.093	0.098	0.109	0.109	0.114	0.122	0.146
420A	0.833	2.118	2.899	OVER	OVER	OVER	OVER	0.902	0.405	0.21	0.183
420B	0.836	2.117	2.908	OVER	OVER	OVER	OVER	0.935	0.409	0.193	0.187
C420	0.087	0.087	0.088	0.092	0.096						
421A	0.057	0.078	0.097	0.141	0.199	0.294	0.39	0.427	0.462	0.507	0.555
421B	0.058	0.078	0.096	0.137	0.196	0.287	0.377	0.413	0.445	0.489	0.531
C421	0.049	0.052	0.055	0.057	0.06	0.062	0.067	0.072	0.077	0.088	0.108
422A	1.422	3.009	3.399	OVER	OVER	OVER	OVER	0.919	0.442	0.261	0.234
422B	1.444	2.985	3.485	OVER	OVER	OVER	OVER	0.999	0.495	0.27	0.235
C422	0.1	0.102	0.103	0.105	0.109	0.112	0.122	0.131	0.149	0.188	0.245
423A	0.099	0.119	0.14	0.184	0.246	0.343	0.435	0.474	0.518	0.563	0.614
423B	0.104	0.124	0.143	0.185	0.247	0.343	0.431	0.468	0.512	0.556	0.609
C423	0.093	0.096	0.097	0.099	0.103	0.109	0.116	0.119	0.128	0.141	0.162
424A	1.61	3.098	OVER	OVER	OVER	OVER	2.085	0.849	0.44	0.258	0.225
424B	1.623	3.111	OVER	OVER	OVER	OVER	2.219	0.895	0.522	0.252	0.243
C424	0.139	0.143	0.142	0.147	0.151	0.157	0.168	0.178	0.198	0.241	0.306
425A	0.07	0.085	0.096	0.12	0.147	0.214	0.293	0.333	0.383	0.428	0.455
425B	0.067	0.079	0.087	0.109	0.153	0.197	0.272	0.309	0.358	0.395	0.422
C425	0.062	0.07	0.073	0.078	0.083	0.093	0.103	0.109	0.122	0.141	0.155
426A	0.578	1.905	2.895	OVER	OVER	OVER	OVER	1.746	0.513	0.243	0.192
426B	0.602	1.987	3.008	OVER	OVER	OVER	OVER	OVER	0.627	0.33	0.181
C426	0.076	0.086	0.097	0.1	0.111	0.125	0.142	0.148	0.172	0.214	0.269
427A	0.113	0.127	0.139	0.164	0.192	0.256	0.337	0.383	0.444	0.493	0.524
427B	0.114	0.128	0.14	0.162	0.193	0.257	0.337	0.381	0.441	0.494	0.523
C427	0.11	0.117	0.123	0.126	0.131	0.142	0.154	0.156	0.171	0.196	0.218
428A	0.693	2.071	3.097	OVER	OVER	OVER	OVER	2.305	0.508	0.24	0.172
428B	0.698	2.036	3.026	OVER	OVER	OVER	OVER	OVER	0.553	0.256	0.198
C428	0.108	0.121	0.126	0.133	0.139	0.154	0.172	0.184	0.212	0.248	0.298
429A	0.082	0.108	0.128	0.161	0.205	0.282	0.351	0.378	0.414	0.45	0.483
429B	0.08	0.102	0.119	0.151	0.194	0.273	0.343	0.369	0.401	0.436	0.469
C429	0.067	0.075	0.08	0.084	0.089	0.098	0.107	0.112	0.125	0.145	0.165
430A	1.257	3.217	OVER	OVER	OVER	OVER	OVER	OVER	0.724	0.321	0.242
430B	1.242	3.106	OVER	OVER	OVER	OVER	OVER	1.65	0.594	0.265	0.219
C430	0.115	0.127	0.131	0.137	0.142	0.157	0.177	0.189	0.219	0.268	0.324
431A	0.125	0.139	0.16	0.199	0.232	0.313	0.385	0.41	0.447	0.482	0.525
431B	0.107	0.128	0.147	0.182	0.225	0.313	0.384	0.4	0.437	0.467	0.527
C431	0.122	0.132	0.137	0.138	0.146	0.158	0.17	0.18	0.194	0.221	0.24
432A	1.59	3.317	OVER	OVER	OVER	OVER	OVER	1.726	0.547	0.342	0.269
432B	1.394	3.379	OVER	OVER	OVER	OVER	OVER	OVER	0.784	0.392	0.297
C432	0.16	0.167	0.172	0.191	0.186	0.205	0.225	0.237	0.27	0.325	0.387
433A	0.059	0.078	0.095	0.133	0.193	0.3	0.447	0.521	0.62	0.693	0.721
433B	0.06	0.078	0.097	0.135	0.198	0.307	0.457	0.532	0.637	0.715	0.744
C433	0.053	0.058	0.062	0.066	0.072	0.076	0.082	0.086	0.092	0.103	0.113
434A	1.43	OVER	OVER	OVER	OVER	OVER	1.377	0.832	0.407	0.227	0.214
434B	1.428	OVER	OVER	OVER	OVER	OVER	1.368	0.784	0.389	0.253	0.229
C434	0.062	0.064	0.069	0.072	0.077	0.081	0.089	0.095	0.106	0.124	0.14
435A	0.091	0.113	0.132	0.173	0.242	0.367	0.514	0.603	0.704	0.787	0.814
435B	0.099	0.121	0.14	0.181	0.248	0.371	0.519	0.601	0.721	0.803	0.828
C435	0.1	0.104	0.108	0.113	0.12	0.126	0.135	0.139	0.147	0.162	0.18
436A	1.586	OVER	OVER	OVER	OVER	OVER	1.372	0.812	0.382	0.216	0.225
436B	1.656	OVER	OVER	OVER	OVER	OVER	1.304	0.864	0.421	0.226	0.215
C436	0.086	0.092	0.096	0.099	0.105	0.111	0.12	0.126	0.142	0.167	0.189
437A	0.069	0.092	0.115	0.158	0.223	0.341	0.497	0.584	0.715	0.826	0.889
437B	0.064	0.086	0.107	0.145	0.212	0.324	0.484	0.566	0.687	0.791	0.831
C437	0.056	0.062	0.067	0.074	0.082	0.092	0.102	0.107	0.121	0.142	0.155
438A	1.542	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.919	0.323	0.217
438B	1.564	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.828	0.378	0.189
C438	0.069	0.076	0.081	0.087	0.095	0.106	0.119	0.128	0.146	0.182	0.204
439A	0.094	0.116	0.135	0.176	0.246	0.364	0.521	0.603	0.739	0.837	0.885
439B	0.086	0.106	0.128	0.17	0.243	0.37	0.554	0.633	0.757	0.866	0.912
C439	0.117	0.124	0.131	0.138	0.147	0.158	0.174	0.181	0.201	0.228	0.24
440A	1.76	OVER	OVER	OVER	OVER	OVER	OVER	2.323	0.649	0.78	0.228
440B	1.807	OVER	OVER	OVER	OVER	OVER	OVER	OVER	0.834	0.377	0.35
C440	0.099	0.107	0.115	0.119	0.132	0.142	0.156	0.165	0.187	0.228	0.261
441A	0.045	0.05	0.054	0.065	0.122	0.174	0.204	0.216	0.216	0.079	0.051
441B	0.028	0.031	0.039	0.053	0.107	0.163	0.193	0.201	0.196	0.049	0.028
C441	0.028	0.028	0.03	0.032	0.032	0.032	0.034	0.035	0.048	0.05	0.037
442A	0.109	0.358	0.731	1.08	1.17	1.073	0.87	0.432	0.147	0.066	0.052
442B	0.113	0.368	0.74	1.1	1.175	1.083	0.872	0.431	0.155	0.068	0.052
C442	0.043	0.044	0.046	0.046	0.049	0.057	0.073	0.081	0.083	0.072	0.063
443A	0.061	0.064	0.078	0.09	0.138	0.193	0.188	0.175	0.099	0.031	0.027
443B	0.066	0.069	0.08	0.096	0.147	0.202	0.194	0.158	0.096	0.022	0.029
C443	0.062	0.062	0.065	0.066	0.068	0.086	0.096	0.081	0.061	0.026	0.024

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
444A	0.171	0.436	0.783	1.086	1.177	0.927	0.603	0.367	0.139	0.074	0.068
444B	0.175	0.449	0.792	1.1	1.179	0.936	0.625	0.365	0.148	0.074	0.023
C444	0.088	0.089	0.09	0.093	0.099	0.115	0.125	0.121	0.098	0.074	0.073
445A	0.034	0.041	0.058	0.089	0.15	0.186	0.196	0.188	0.168	0.045	0.021
445B	0.036	0.043	0.061	0.092	0.152	0.188	0.195	0.193	0.166	0.043	0.026
C445	0.031	0.032	0.034	0.034	0.034	0.036	0.039	0.049	0.055	0.055	0.051
446A	0.265	0.694	1.093	1.32	1.252	1.157	0.811	0.449	0.202	0.124	0.118
446B	0.265	0.695	1.089	1.321	1.261	1.155	0.79	0.424	0.203	0.125	0.103
C446	0.081	0.082	0.085	0.087	0.091	0.106	0.12	0.124	0.123	0.117	0.107
447A	0.062	0.07	0.09	0.119	0.185	0.216	0.202	0.168	0.098	0.035	0.035
447B	0.071	0.079	0.099	0.13	0.2	0.228	0.198	0.157	0.087	0.032	0.032
C447	0.069	0.068	0.072	0.071	0.075	0.102	0.105	0.081	0.062	0.044	0.028
448A	0.335	0.758	1.117	1.288	1.225	1.046	0.613	0.377	0.184	0.108	0.121
448B	0.338	0.752	1.091	1.301	1.209	1.029	0.638	0.357	0.191	0.126	0.116
C448	0.128	0.129	0.132	0.137	0.147	0.165	0.162	0.154	0.13	0.112	0.114
449A	0.028	0.029	0.028	0.027	0.024	0.008	0.007	0.006	0.008	0.007	0.008
449B	0.028	0.029	0.028	0.027	0.023	0.008	0.008	0.007	0.007	0.008	0.009
C449	0.03	0.031	0.031	0.029	0.026	0.011	0.009	0.009	0.008	0.01	0.012
450A	0.069	0.293	1.947	OVER	OVER	OVER	OVER	1.014	0.341	0.078	0.024
450B	0.069	0.293	1.941	OVER	OVER	OVER	OVER	1.131	0.336	0.092	0.031
C450	0.051	0.074	0.152	1.289	2.79	OVER	OVER	OVER	2.687	0.449	0.115
451A	0.067	0.067	0.065	0.064	0.061	0.047	0.041	0.037	0.034	0.03	0.026
451B	0.078	0.074	0.072	0.071	0.069	0.054	0.044	0.045	0.039	0.033	0.031
C451	0.072	0.069	0.066	0.064	0.062	0.052	0.04	0.036	0.033	0.03	0.021
452A	0.13	0.377	2.198	OVER	OVER	OVER	1.794	0.995	0.416	0.151	0.048
452B	0.129	0.367	2.097	OVER	OVER	OVER	2.669	1.117	0.342	0.107	0.035
C452	0.105	0.125	0.218	1.681	3.039	OVER	OVER	2.907	1.325	0.533	0.214
453A	0.032	0.034	0.035	0.044	0.166	0.427	0.337	0.274	0.191	0.112	0.058
453B	0.033	0.034	0.035	0.045	0.218	0.565	0.451	0.377	0.273	0.162	0.075
C453	0.033	0.035	0.035	0.037	0.076	0.243	0.173	0.128	0.085	0.044	0.025
454A	0.175	0.967	3.15	OVER	OVER	OVER	3.32	2.705	1.816	1.017	0.5399
454B	0.177	0.989	3.213	OVER	OVER	OVER	3.051	2.345	1.566	0.971	0.439
C454	0.102	0.197	0.567	1.694	3.12	OVER	OVER	2.249	1.336	0.678	0.55
455A	0.084	0.082	0.081	0.081	0.136	0.34	0.211	0.126	0.049	0.02	0.017
455B	0.095	0.092	0.09	0.09	0.163	0.539	0.416	0.281	0.121	0.039	0.018
C455	0.097	0.097	0.094	0.093	0.102	0.297	0.221	0.175	0.078	0.022	0.011
456A	0.259	1.143	3.322	OVER	OVER	2.966	3.135	2.568	1.53	0.791	0.386
456B	0.255	1.131	3.302	OVER	OVER	2.879	2.657	2.047	1.315	0.724	0.414
C456	0.142	0.226	0.522	1.687	2.99	OVER	2.736	2.005	1.112	0.6	0.605
457A	0.038	0.049	0.063	0.111	0.443	0.737	0.667	0.562	0.344	0.19	0.057
457B	0.038	0.049	0.064	0.116	0.454	0.767	0.673	0.559	0.312	0.168	0.065
C457	0.037	0.039	0.041	0.045	0.148	0.66	0.636	0.555	0.317	0.156	0.079
458A	0.114	0.349	0.779	1.595	2.191	2.626	0.978	0.539	0.169	0.075	0.029
458B	0.101	0.343	0.748	1.522	2.083	2.438	0.922	0.482	0.176	0.14	0.099
C458	0.053	0.057	0.066	0.092	0.323	0.811	0.947	0.905	0.319	0.162	0.109
459A	0.091	0.104	0.118	0.159	0.477	0.74	0.597	0.488	0.241	0.061	0.019
459B	0.075	0.084	0.098	0.135	0.398	0.754	0.622	0.478	0.283	0.073	0.026
C459	0.078	0.081	0.084	0.095	0.184	0.699	0.632	0.516	0.325	0.101	0.032
460A	0.149	0.379	0.753	1.486	1.965	1.82	0.885	0.431	0.196	0.063	0.03
460B	0.144	0.364	0.651	1.235	1.673	1.81	0.774	0.367	0.227	0.089	0.054
C460	0.095	0.1	0.115	0.163	0.568	0.91	1.144	0.749	0.314	0.153	0.076
461A	0.045	0.071	0.12	0.322	0.75	1.189	1.358	1.1	0.577	0.184	0.066
461B	0.043	0.069	0.115	0.309	0.76	1.222	1.368	1.098	0.567	0.185	0.058
C461	0.043	0.052	0.069	0.123	0.488	0.739	1.114	1.071	0.719	0.327	0.116
462A	0.217	0.566	0.943	1.421	1.86	2.168	0.793	0.612	0.595	0.254	0.222
462B	0.218	0.58	1.032	1.571	2.076	2.447	0.834	0.704	0.678	0.265	0.209
C462	0.091	0.103	0.125	0.189	0.535	1.108	1.416	1.331	0.468	0.291	0.226
463A	0.089	0.117	0.164	0.35	0.848	1.275	1.432	1.147	0.596	0.138	0.063
463B	0.104	0.137	0.192	0.418	0.79	1.066	1.191	1.066	0.608	0.166	0.049
C463	0.078	0.088	0.098	0.144	0.534	0.713	0.894	0.975	0.62	0.212	0.098
464A	0.278	0.626	0.99	1.427	1.799	1.452	0.737	0.577	0.515	0.189	0.158
464B	0.267	0.612	0.983	1.431	1.823	1.52	0.776	0.606	0.582	0.218	0.195
C464	0.144	0.158	0.19	0.289	0.701	1.138	1.348	0.945	0.522	0.273	0.209
465A	0.028	0.027	0.028	0.028	0.028	0.029	0.029		0.028	0.027	0.027
465B	0.029	0.028	0.029	0.029	0.029	0.03	0.029		0.029	0.027	0.028
C465	0.028	0.027	0.028	0.027	0.027	0.027	0.026		0.026	0.025	0.025
466A	0.069	0.066	0.057	0.045	0.053	0.104	0.222		0.434	0.585	0.66
466B	0.057	0.06	0.05	0.045	0.055	0.114	0.332		0.517	0.676	0.75
C466	0.049	0.048	0.048	0.048	0.048	0.048	0.046		0.046	0.043	0.042
467A	0.074	0.071	0.071	0.069	0.068	0.064	0.058		0.043	0.038	0.036
467B	0.069	0.065	0.067	0.065	0.063	0.06	0.055		0.04	0.036	0.034
C467	0.07	0.071	0.069	0.066	0.064	0.061	0.057		0.047	0.037	0.035
468A	0.126	0.121	0.112	0.105	0.118	0.248	0.71		1.243	1.415	1.276
468B	0.093	0.094	0.084	0.077	0.089	0.189	0.496		0.863	1.086	1.179
C468	0.107	0.103	0.104	0.1	0.097	0.092	0.084		0.063	0.055	0.051
469A	0.029	0.028	0.028	0.028	0.03	0.03	0.03		0.03	0.029	0.031
469B	0.028	0.029	0.029	0.029	0.03	0.03	0.03		0.03	0.03	0.03
C469	0.029	0.027	0.028	0.027	0.027	0.027	0.028		0.029	0.027	0.026
470A	0.1	0.094	0.084	0.085	0.119	0.176	0.384		0.732	0.933	1.022
470B	0.098	0.093	0.082	0.084	0.117	0.174	0.372		0.712	0.922	1.015
C470	0.082	0.081	0.082	0.087	0.083	0.086	0.084		0.085	0.084	0.082
471A	0.093	0.09	0.09	0.089	0.087	0.083	0.077		0.065	0.055	0.051
471B	0.081	0.076	0.076	0.075	0.073	0.07	0.065		0.055	0.046	0.043
C471	0.077	0.073	0.071	0.069	0.069	0.065	0.06		0.045	0.041	0.039
472A	0.147	0.14	0.128	0.132	0.171	0.407	0.819		1.267	1.353	1.372
472B	0.136	0.129	0.118	0.12	0.157	0.318	0.668		1.148	1.343	1.408
C472	0.137	0.133	0.132	0.131	0.129	0.126	0.121		0.105	0.096	0.092

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
473A	0.03	0.031	0.032	0.031	0.032	0.042	0.07	0.08	0.08	0.024	0.01
473B	0.029	0.03	0.031	0.031	0.032	0.044	0.073	0.096	0.084	0.024	0.011
C473	0.031	0.031	0.031	0.031	0.031	0.031	0.032	0.028	0.03	0.023	0.017
474A	0.086	0.693	1.257	1.532	1.617	1.437	0.615	0.301	0.124	0.054	0.063
474B	0.086	0.706	1.269	1.536	1.619	1.446	0.597	0.293	0.138	0.053	0.064
C474	0.056	0.056	0.057	0.057	0.056	0.055	0.053	0.054	0.072	0.066	0.053
475A	0.067	0.065	0.064	0.063	0.065	0.097	0.139	0.143	0.105	0.036	0.018
475B	0.062	0.06	0.059	0.059	0.06	0.083	0.123	0.114	0.1	0.038	0.021
C475	0.064	0.065	0.064	0.063	0.062	0.06	0.064	0.058	0.045	0.024	0.02
476A	0.153	0.822	1.329	1.56	1.582	1.125	0.536	0.294	0.146	0.113	0.114
476B	0.133	0.797	1.321	1.569	1.588	1.178	0.538	0.279	0.118	0.05	0.057
C476	0.088	0.085	0.086	0.083	0.081	0.076	0.09	0.116	0.108	0.063	0.054
477A	0.035	0.036	0.036	0.038	0.043	0.068	0.124	0.11	0.095	0.038	0.024
477B	0.034	0.036	0.036	0.037	0.042	0.067	0.122	0.119	0.093	0.038	0.022
C477	0.034	0.036	0.035	0.035	0.036	0.036	0.036	0.034	0.038	0.03	0.019
478A	0.296	1.391	1.786	1.908	1.91	1.218	0.557	0.289	0.171	0.092	0.073
478B	0.312	1.393	1.785	1.889	1.881	1.248	0.592	0.284	0.175	0.111	0.092
C478	0.085	0.086	0.085	0.09	0.087	0.089	0.094	0.117	0.127	0.107	0.093
479A	0.069	0.067	0.068	0.067	0.08	0.146	0.178	0.152	0.09	0.041	0.022
479B	0.077	0.074	0.073	0.076	0.087	0.165	0.181	0.149	0.094	0.04	0.024
C479	0.068	0.067	0.071	0.069	0.065	0.064	0.073	0.065	0.058	0.028	0.027
480A	0.41	1.445	1.811	1.871	1.743	0.92	0.509	0.304	0.163	0.107	0.09
480B	0.381	1.442	1.791	1.901	1.827	1.028	0.547	0.31	0.169	0.111	0.085
C480	0.112	0.11	0.109	0.107	0.109	0.127	0.158	0.155	0.149	0.107	0.104
481A	0.036	0.044	0.051	0.062	0.095	0.218	0.567	0.6	0.45	0.35	0.282
481B	0.037	0.048	0.051	0.069	0.138	0.228	0.562	0.726	0.436	0.333	0.296
C481	0.036	0.042	0.046	0.052	0.065	0.1	0.364	0.59	0.548	0.416	0.333
482A	0.138	0.507	1.288	2.202	OVER	OVER	OVER	OVER	OVER	3.006	2.98
482B	0.139	0.509	1.302	2.224	OVER	OVER	OVER	OVER	OVER	3.038	2.894
C482	0.053	0.062	0.076	0.112	0.327	0.759	2.892	OVER	3.266	3.102	3.076
483A	0.056	0.062	0.069	0.082	0.118	0.26	0.576	0.568	0.452	0.374	0.285
483B	0.065	0.069	0.077	0.094	0.127	0.275	0.576	0.576	0.462	0.381	0.314
C483	0.133	0.071	0.076	0.094	0.097	0.235	0.413	0.574	0.58	0.435	0.334
484A	0.177	0.539	1.315	2.215	OVER	OVER	OVER	OVER	3.126	3.061	2.92
484B	0.182	0.573	1.331	2.267	OVER	OVER	OVER	OVER	3.106	3.063	2.978
C484	0.081	0.09	0.105	0.147	0.371	0.8	2.854	OVER	3.211	3.23	3.114
485A	0.047	0.057	0.071	0.096	0.243	0.707	1.29	1.342	1.035	0.84	0.703
485B	0.047	0.058	0.071	0.096	0.235	0.69	1.271	1.355	1.029	0.818	0.68
C485	0.061	0.063	0.067	0.078	0.109	0.335	0.853	1.325	1.164	0.946	0.794
486A	0.309	0.921	1.752	2.636	OVER	OVER	OVER	OVER	3.058	3.156	3.077
486B	0.313	0.922	1.74	2.596	OVER	OVER	OVER	OVER	3.079	3.227	3.108
C486	0.099	0.116	0.147	0.227	0.466	1.055	OVER	OVER	3.044	0.88	0.391
487A	0.076	0.088	0.1	0.134	0.311	0.74	1.276	1.305	1.056	0.873	0.724
487B	0.074	0.082	0.098	0.128	0.306	0.742	1.267	1.314	1.044	0.87	0.722
C487	0.081	0.086	0.093	0.105	0.149	0.443	0.939	1.393	1.185	0.994	0.837
488A	0.393	0.977	1.781	2.694	OVER	OVER	OVER	OVER	3.091	3.197	3.121
488B	0.377	0.979	1.788	2.67	OVER	OVER	OVER	OVER	3.075	3.18	3.179
C488	0.139	0.155	0.208	0.284	0.539	1.112	OVER	OVER	3.057	3.226	1.129
489A	0.034	0.035	0.036	0.045	0.059	0.121	0.377	0.548	0.763	0.506	0.363
489B	0.038	0.046	0.051	0.046	0.076	0.138	0.377	0.546	0.8	0.542	0.383
C489	0.03	0.032	0.031	0.032	0.034	0.035	0.042	0.046	0.163	0.834	0.627
490A	0.148	0.434	0.736	1.64	2.424	3.231	1.134	0.973	0.603	0.265	0.169
490B	0.148	0.44	0.756	1.691	2.526	3.402	1.181	0.949	0.606	0.264	0.129
C490	0.043	0.044	0.045	0.05	0.057	0.104	0.379	0.618	1.731	0.484	0.559
491A	0.095	0.067	0.114	0.119	0.138	0.236	0.507	0.659	0.692	0.6	0.401
491B	0.06	0.064	0.068	0.077	0.095	0.172	0.452	0.596	0.675	0.496	0.389
C491	0.061	0.071	0.065	0.071	0.07	0.076	0.153	0.14	0.409	0.677	0.592
492A	0.195	0.47	0.744	1.613	2.41	3.03	1.061	0.903	0.533	0.226	0.138
492B	0.193	0.475	0.758	1.634	2.457	3.135	1.068	0.998	0.572	0.274	0.178
C492	0.079	0.08	0.08	0.088	0.096	0.159	0.374	0.631	0.969	0.522	0.52
493A	0.036	0.043	0.047	0.064	0.103	0.333	0.715	1.059	1.616	1.175	0.941
493B	0.036	0.043	0.049	0.061	0.108	0.345	0.738	1.091	1.62	1.18	0.955
C493	0.035	0.037	0.037	0.039	0.041	0.044	0.056	0.082	0.469	1.668	1.298
494A	0.306	0.727	1.091	1.831	2.465	OVER	1.757	1.188	0.57	0.545	0.446
494B	0.31	0.733	1.097	1.832	2.456	OVER	1.76	1.249	0.59	0.55	0.514
C494	0.089	0.089	0.093	0.099	0.116	0.2	0.463	0.838	0.855	0.702	0.737
495A	0.073	0.079	0.084	0.107	0.157	0.418	0.763	1.039	1.485	1.135	0.922
495B	0.078	0.085	0.093	0.115	0.17	0.429	0.783	1.045	1.471	1.14	0.915
C495	0.068	0.064	0.071	0.075	0.077	0.083	0.165	0.291	0.826	1.438	1.173
496A	0.366	0.771	1.103	1.87	2.435	3.463	1.298	1.083	0.562	0.526	0.471
496B	0.368	0.771	1.114	1.821	2.437	3.424	1.274	1.134	0.601	0.621	0.509
C496	0.14	0.143	0.148	0.16	0.186	0.273	0.49	0.741	0.645	0.541	0.485
497A	0.039	0.043	0.046	0.062	0.143	0.231	0.328	0.375	0.441	0.479	0.489
497B	0.039	0.04	0.045	0.059	0.132	0.222	0.324	0.376	0.449	0.473	0.467
C497	0.037	0.037	0.038	0.038	0.04	0.041	0.042	0.063	0.102	0.134	0.157
498A	0.155	0.538	0.963	1.442	2.048	2.397	2.324	1.971	0.451	0.151	0.114
498B	0.159	0.544	0.969	1.446	2.038	2.393	2.21	1.908	0.401	0.167	0.12
C498	0.047	0.048	0.048	0.051	0.057	0.073	0.119	0.137	0.17	0.22	0.252
499A	0.06	0.063	0.07	0.088	0.171	0.284	0.394	0.449	0.548	0.587	0.605
499B	0.061	0.064	0.071	0.09	0.178	0.294	0.405	0.469	0.564	0.614	0.603
C499	0.077	0.079	0.078	0.078	0.078	0.102	0.208	0.227	0.268	0.296	0.345
500A	0.202	0.598	1.007	1.446	1.985	2.338	2.217	1.825	0.512	0.16	0.123
500B	0.203	0.603	1.009	1.46	2.009	2.344	2.199	1.726	0.535	0.19	0.167
C500	0.078	0.076	0.078	0.083	0.094	0.121	0.175	0.207	0.265	0.32	0.33
501A	0.047	0.053	0.066	0.114	0.215	0.296	0.375	0.408	0.455	0.479	0.484
501B	0.048	0.055	0.07	0.111	0.21	0.29	0.366	0.397	0.448	0.457	0.453
C501	0.055	0.052	0.057	0.054	0.061	0.061	0.096	0.119	0.136	0.175	0.201

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
502A	0.349	0.915	1.334	1.711	2.049	2.204	2.015	1.445	0.422	0.237	0.205
502B	0.348	0.918	1.34	1.715	2.071	2.186	1.985	1.085	0.388	0.212	0.182
C502	0.091	0.092	0.094	0.1	0.113	0.131	0.159	0.174	0.209	0.27	0.302
503A	0.082	0.091	0.109	0.161	0.276	0.363	0.455	0.507	0.605	0.664	0.431
503B	0.083	0.081	0.101	0.156	0.264	0.354	0.442	0.485	0.578	0.614	0.621
C503	0.084	0.083	0.084	0.088	0.095	0.153	0.2	0.232	0.305	0.413	0.409
504A	0.408	0.976	1.38	1.735	2.058	2.164	1.814	1.215	0.353	0.19	0.177
504B	0.42	0.986	1.388	1.743	2.058	2.171	1.784	1.188	0.364	0.197	0.158
C504	0.122	0.124	0.128	0.136	0.155	0.18	0.213	0.234	0.284	0.366	0.377
505A	0.049	0.054	0.059	0.083	0.183	0.3	0.393	0.46	0.559	0.645	0.676
505B	0.044	0.048	0.052	0.07	0.155	0.271	0.361	0.422	0.513	0.586	0.602
C505	0.042	0.044	0.044	0.045	0.049	0.056	0.11	0.137	0.174	0.216	0.251
506A	0.147	0.528	0.858	1.477	2.099	2.723	2.84	2.4	0.555	0.277	0.165
506B	0.158	0.525	0.852	1.479	2.064	2.662	2.875	2.582	0.795	0.361	0.175
C506	0.056	0.058	0.061	0.064	0.076	0.132	0.183	0.218	0.284	0.371	0.433
507A	0.082	0.086	0.093	0.12	0.221	0.363	0.465	0.543	0.698	0.953	1.127
507B	0.078	0.082	0.087	0.111	0.213	0.379	0.475	0.553	0.687	0.819	0.888
C507	0.078	0.084	0.084	0.091	0.104	0.223	0.282	0.279	0.372	0.51	0.598
508A	0.181	0.564	0.882	1.455	2.021	2.612	2.888	2.231	0.989	0.34	0.174
508B	0.201	0.58	0.892	1.489	2.038	2.64	2.952	2.933	1.413	0.44	0.27
C508	0.097	0.094	0.101	0.107	0.126	0.176	0.241	0.311	0.411	0.525	0.621
509A	0.056	0.065	0.076	0.161	0.266	0.367	0.445	0.502	0.591	0.679	0.723
509B	0.056	0.065	0.076	0.161	0.26	0.367	0.441	0.502	0.591	0.679	0.721
C509	0.054	0.056	0.057	0.06	0.065	0.136	0.178	0.199	0.25	0.313	0.359
510A	0.345	0.891	1.231	1.748	2.092	2.556	2.694	2.604	0.741	0.321	0.203
510B	0.341	0.888	1.227	1.742	2.086	2.565	2.728	2.667	0.688	0.325	0.237
C510	0.094	0.099	0.1	0.109	0.128	0.177	0.216	0.25	0.333	0.452	0.53
511A	0.091	0.101	0.114	0.18	0.306	0.427	0.517	0.576	0.713	0.892	1.023
511B	0.082	0.093	0.103	0.168	0.296	0.407	0.5	0.553	0.686	0.856	0.974
C511	0.076	0.079	0.078	0.083	0.094	0.199	0.257	0.286	0.392	0.515	0.604
512A	0.394	0.945	1.287	1.778	2.205	2.645	2.728	2.594	0.686	0.316	0.194
512B	0.395	0.946	1.272	1.75	2.1	2.545	2.701	2.482	0.694	0.325	0.179
C512	0.107	0.111	0.144	0.13	0.159	0.215	0.306	0.335	0.485	0.68	0.713
513A	0.033	0.039	0.044	0.053	0.074	0.108	0.141	0.151	0.148	0.055	0.037
513B	0.031	0.037	0.042	0.053	0.075	0.11	0.146	0.156	0.166	0.06	0.028
C513	0.032	0.032	0.035	0.034	0.035	0.037	0.041	0.044	0.047	0.046	0.038
514A	0.131	0.294	0.399	0.496	0.594	0.676	0.315	0.183	0.126	0.083	0.069
514B	0.136	0.303	0.411	0.508	0.608	0.688	0.321	0.187	0.117	0.077	0.066
C514	0.045	0.048	0.053	0.058	0.066	0.074	0.078	0.077	0.068	0.059	0.048
515A	0.082	0.084	0.089	0.098	0.117	0.143	0.153	0.107	0.055	0.032	0.022
515B	0.085	0.082	0.088	0.098	0.118	0.14	0.146	0.114	0.068	0.035	0.022
C515	0.084	0.079	0.081	0.08	0.081	0.077	0.063	0.046	0.034	0.027	0.019
516A	0.198	0.348	0.448	0.536	0.611	0.515	0.278	0.181	0.143	0.089	0.091
516B	0.187	0.34	0.439	0.532	0.614	0.545	0.319	0.197	0.095	0.083	0.078
C516	0.087	0.089	0.09	0.094	0.1	0.101	0.097	0.078	0.057	0.052	0.05
517A	0.039	0.047	0.056	0.072	0.102	0.135	0.156	0.157	0.151	0.057	0.025
517B	0.04	0.048	0.058	0.075	0.106	0.14	0.161	0.159	0.15	0.056	0.034
C517	0.038	0.041	0.041	0.042	0.045	0.047	0.05	0.052	0.056	0.055	0.047
518A	0.273	0.487	0.569	0.632	0.726	0.712	0.322	0.201	0.132	0.1	0.097
518B	0.27	0.478	0.563	0.625	0.719	0.734	0.32	0.202	0.105	0.095	0.09
C518	0.087	0.092	0.097	0.105	0.114	0.117	0.118	0.117	0.118	0.098	0.086
519A	0.077	0.083	0.092	0.107	0.136	0.164	0.155	0.15	0.074	0.038	0.024
519B	0.079	0.084	0.094	0.111	0.141	0.173	0.159	0.133	0.063	0.039	0.027
C519	0.069	0.067	0.069	0.069	0.073	0.073	0.068	0.059	0.047	0.03	0.026
520A	0.334	0.519	0.6	0.654	0.703	0.565	0.311	0.213	0.118	0.102	0.105
520B	0.326	0.516	0.594	0.649	0.71	0.559	0.31	0.217	0.148	0.111	0.107
C520	0.143	0.146	0.149	0.154	0.158	0.156	0.136	0.123	0.102	0.096	0.091
521A	0.212	0.336	0.406	0.489	0.607	0.726	0.794	0.809	0.711	0.228	0.112
521B	0.214	0.34	0.406	0.492	0.61	0.74	0.818	0.835	0.789	0.261	0.163
C521	0.205	0.332	0.397	0.476	0.583	0.686	0.744	0.765	0.7	0.212	0.107
522A	0.219	0.566	0.817	1.132	1.527	1.769	0.604	0.444	0.261	0.29	0.349
522B	0.233	0.589	0.841	1.156	1.549	1.769	0.637	0.455	0.285	0.285	0.346
C522	0.16	0.279	0.347	0.426	0.536	0.664	0.579	0.382	0.247	0.271	0.295
523A	0.264	0.409	0.481	0.565	0.669	0.738	0.688	0.628	0.368	0.158	0.104
523B	0.278	0.396	0.464	0.547	0.651	0.751	0.781	0.759	0.404	0.15	0.105
C523	0.307	0.411	0.471	0.541	0.629	0.686	0.684	0.577	0.334	0.143	0.105
524A	0.252	0.593	0.846	1.155	1.485	0.978	0.64	0.469	0.26	0.297	0.326
524B	0.242	0.569	0.82	1.127	1.444	0.813	0.645	0.448	0.247	0.278	0.322
C524	0.174	0.279	0.347	0.423	0.515	0.532	0.349	0.299	0.244	0.249	0.3
525A	0.273	0.405	0.485	0.596	0.759	0.93	1.044	1.083	0.819	0.435	0.3
525B	0.277	0.408	0.492	0.599	0.764	0.937	1.041	1.073	0.804	0.434	0.307
C525	0.275	0.396	0.465	0.56	0.692	0.806	0.87	0.906	0.619	0.387	0.312
526A	0.352	0.795	1.051	1.32	1.629	1.156	0.589	0.456	0.347	0.432	0.457
526B	0.372	0.815	1.074	1.353	1.666	1.045	0.605	0.491	0.382	0.435	0.488
C526	0.234	0.352	0.416	0.493	0.607	0.747	0.548	0.41	0.37	0.419	0.44
527A	0.326	0.493	0.583	0.702	0.863	0.979	0.889	0.796	0.554	0.396	0.26
527B	0.262	0.399	0.473	0.575	0.728	0.894	0.832	0.761	0.677	0.403	0.34
C527	0.344	0.447	0.512	0.598	0.714	0.815	0.796	0.674	0.432	0.436	0.406
528A	0.335	0.703	0.925	1.143	1.358	0.838	0.57	0.47	0.297	0.389	0.451
528B	0.372	0.774	1.005	1.243	1.433	0.856	0.612	0.45	0.315	0.399	0.454
C528	0.24	0.331	0.381	0.44	0.515	0.474	0.353	0.329	0.342	0.43	0.433
529A	0.066	0.097	0.117	0.147	0.197	0.258	0.311	0.329	0.35	0.156	0.115
529B	0.057	0.082	0.1	0.13	0.179	0.258	0.371	0.428	0.515	0.565	0.59
C529	0.053	0.073	0.08	0.093	0.111	0.136	0.168	0.186	0.227	0.278	0.321
530A	0.085	0.15	0.197	0.263	0.421	0.633	0.794	0.438	0.218	0.135	0.198
530B	0.091	0.159	0.209	0.279	0.448	0.66	0.742	0.425	0.211	0.138	0.212
C530	0.051	0.057	0.061	0.066	0.072	0.082	0.094	0.102	0.146	0.253	0.347

418nm Absorbance zeroed to DI at X hours

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
531A	0.085	0.128	0.148	0.178	0.227	0.299	0.374	0.403	0.316	0.175	0.144
531B	0.088	0.127	0.146	0.176	0.225	0.304	0.411	0.46	0.522	0.508	0.39
C531	0.087	0.121	0.132	0.149	0.168	0.195	0.232	0.254	0.293	0.337	0.358
532A	0.127	0.199	0.249	0.315	0.464	0.677	0.723	0.496	0.284	0.143	0.23
532B	0.128	0.195	0.241	0.299	0.387	0.613	0.851	0.854	0.365	0.204	0.182
C532	0.104	0.11	0.113	0.12	0.127	0.138	0.164	0.187	0.26	0.338	0.259
533A	0.067	0.097	0.123	0.166	0.235	0.333	0.442	0.481	0.552	0.615	0.658
533B	0.06	0.093	0.117	0.156	0.223	0.312	0.41	0.454	0.519	0.58	0.626
C533	0.071	0.097	0.107	0.126	0.152	0.179	0.199	0.21	0.233	0.213	0.152
534A	0.159	0.243	0.287	0.332	0.436	0.635	0.785	0.812	0.458	0.285	0.269
534B	0.164	0.254	0.303	0.37	0.529	0.719	0.819	0.428	0.261	0.224	0.332
C534	0.098	0.107	0.114	0.12	0.13	0.143	0.173	0.206	0.321	0.49	0.352
535A	0.096	0.134	0.161	0.205	0.277	0.381	0.489	0.536	0.616	0.682	0.724
535B	0.099	0.139	0.167	0.211	0.285	0.389	0.495	0.539	0.602	0.655	0.663
C535	0.081	0.098	0.107	0.121	0.139	0.159	0.184	0.199	0.237	0.284	0.327
536A	0.211	0.305	0.353	0.417	0.578	0.764	0.76	0.507	0.32	0.254	0.347
536B	0.209	0.305	0.355	0.432	0.597	0.786	0.598	0.43	0.294	0.276	0.374
C536	0.145	0.153	0.161	0.169	0.181	0.195	0.226	0.26	0.364	0.466	0.323
537A	0.031	0.026	0.028	0.028	0.028	0.031	0.032	0.037	0.151	0.208	0.219
537B	0.026	0.026	0.026	0.027	0.027	0.029	0.031	0.036	0.147	0.206	0.215
C537	0.027	0.026	0.026	0.027	0.027	0.028	0.028	0.028	0.031	0.032	0.034
538A	0.064	0.142	0.217	0.364	0.601	0.959	1.234	1.297	1.354	1.338	1.002
538B	0.065	0.144	0.221	0.371	0.613	0.966	1.26	1.321	1.375	1.353	0.943
C538	0.046	0.046	0.048	0.049	0.049	0.051	0.061	0.068	0.074	0.079	0.085
539A	0.072	0.07	0.069	0.069	0.069	0.07	0.07	0.096	0.233	0.249	0.263
539B	0.071	0.071	0.07	0.07	0.07	0.07	0.072	0.103	0.233	0.257	0.273
C539	0.075	0.074	0.073	0.073	0.072	0.071	0.07	0.07	0.071	0.061	0.063
540A	0.112	0.194	0.272	0.424	0.672	1.021	1.308	1.374	1.412	1.367	0.734
540B	0.128	0.21	0.286	0.438	0.687	1.039	1.324	1.389	1.446	1.379	0.669
C540	0.094	0.093	0.093	0.092	0.092	0.094	0.111	0.116	0.124	0.13	0.136
541A	0.028	0.029	0.029	0.029	0.031	0.033	0.047	0.102	0.184	0.205	0.207
541B	0.029	0.028	0.028	0.03	0.032	0.033	0.046	0.096	0.183	0.204	0.209
C541	0.029	0.029	0.029	0.03	0.031	0.03	0.031	0.032	0.035	0.036	0.037
542A	0.136	0.292	0.381	0.518	0.74	1.04	1.219	1.248	1.286	1.303	1.286
542B	0.136	0.295	0.386	0.519	0.742	1.033	1.206	1.238	1.285	1.308	1.296
C542	0.083	0.083	0.085	0.087	0.094	0.104	0.117	0.12	0.126	0.131	0.136
543A	0.072	0.07	0.069	0.069	0.071	0.073	0.142	0.201	0.252	0.269	0.274
543B	0.068	0.066	0.065	0.066	0.067	0.067	0.104	0.172	0.2536	0.247	0.247
C543	0.069	0.072	0.069	0.067	0.067	0.072	0.065	0.066	0.071	0.07	0.075
544A	0.188	0.346	0.428	0.561	0.777	1.057	1.242	1.275	1.333	1.336	1.239
544B	0.188	0.343	0.426	0.559	0.773	1.053	1.241	1.28	1.326	1.314	1.066
C544	0.129	0.128	0.128	0.131	0.133	0.142	0.16	0.166	0.178	0.19	0.194
545A	0.043	0.043	0.043	0.045	0.051	0.053	0.066	0.067	0.064	0.058	0.044
545B	0.043	0.043	0.045	0.047	0.052	0.06	0.068	0.071	0.066	0.057	0.047
C545	0.042	0.042	0.043	0.043	0.043	0.042	0.032	0.03	0.028	0.023	0.019
546A	0.081	0.132	0.166	0.204	0.247	0.31	0.184	0.11	0.071	0.051	0.044
546B	0.079	0.131	0.166	0.204	0.246	0.311	0.17	0.109	0.069	0.052	0.042
C546	0.062	0.065	0.065	0.072	0.065	0.07	0.066	0.064	0.067	0.061	0.064
547A	0.061	0.062	0.063	0.064	0.068	0.075	0.084	0.081	0.088	0.084	0.06
547B	0.066	0.065	0.066	0.068	0.071	0.076	0.086	0.082	0.09	0.081	0.062
C547	0.067	0.065	0.066	0.064	0.063	0.057	0.05	0.045	0.036	0.034	0.027
548A	0.116	0.164	0.198	0.235	0.277	0.331	0.161	0.122	0.076	0.058	0.048
548B	0.11	0.158	0.191	0.23	0.27	0.328	0.161	0.07	0.078	0.055	0.048
C548	0.074	0.074	0.075	0.076	0.075	0.074	0.066	0.064	0.063	0.061	0.059
549A	0.043	0.045	0.049	0.054	0.064	0.077	0.088	0.085	0.073	0.063	0.054
549B	0.044	0.046	0.049	0.054	0.065	0.079	0.086	0.087	0.074	0.072	0.053
C549	0.043	0.044	0.045	0.045	0.046	0.044	0.039	0.037	0.032	0.029	0.024
550A	0.149	0.222	0.253	0.281	0.33	0.389	0.171	0.133	0.108	0.09	0.086
550B	0.147	0.219	0.252	0.282	0.336	0.393	0.163	0.129	0.102	0.089	0.083
C550	0.087	0.088	0.09	0.092	0.094	0.095	0.095	0.095	0.095	0.095	0.096
551A	0.066	0.067	0.069	0.073	0.084	0.096	0.104	0.1	0.087	0.089	0.064
551B	0.065	0.067	0.069	0.075	0.087	0.102	0.109	0.107	0.088	0.078	0.07
C551	0.064	0.064	0.063	0.064	0.063	0.057	0.052	0.043	0.042	0.036	0.033
552A	0.171	0.239	0.269	0.298	0.343	0.401	0.166	0.136	0.113	0.089	0.087
552B	0.199	0.256	0.287	0.315	0.36	0.418	0.178	0.146	0.117	0.105	0.099
C552	0.107	0.11	0.11	0.112	0.114	0.114	0.111	0.11	0.106	0.105	0.105
553A	0.06	0.07	0.088	0.11	0.159	0.24	0.379	0.475	0.637	0.713	0.655
553B	0.052	0.07	0.082	0.108	0.155	0.234	0.365	0.467	0.635	0.693	0.651
C553	0.048	0.065	0.074	0.091	0.117	0.157	0.227	0.288	0.413	0.692	0.75
554A	0.111	0.187	0.238	0.306	0.398	0.54	0.864	1.118	1.702	2.999	OVER
554B	0.114	0.189	0.24	0.31	0.399	0.539	0.85	1.106	1.696	2.982	OVER
C554	0.063	0.074	0.08	0.092	0.112	0.143	0.201	0.269	0.493	1.336	2.456
555A	0.105	0.125	0.138	0.163	0.211	0.287	0.406	0.5	0.652	0.676	0.633
555B	0.092	0.116	0.126	0.168	0.203	0.276	0.401	0.496	0.668	0.682	0.642
C555	0.098	0.115	0.125	0.141	0.165	0.205	0.271	0.331	0.451	0.703	0.709
556A	0.164	0.239	0.292	0.361	0.456	0.598	0.897	1.198	1.789	3.056	OVER
556B	0.159	0.233	0.285	0.351	0.445	0.584	0.901	1.173	1.77	2.995	OVER
C556	0.098	0.109	0.114	0.125	0.146	0.171	0.231	0.292	0.505	1.273	2.279
557A	0.064	0.089	0.106	0.141	0.213	0.321	0.499	0.636	0.899	1.376	1.418
557B	0.066	0.098	0.108	0.143	0.228	0.321	0.501	0.652	0.908	1.363	1.397
C557	0.061	0.078	0.09	0.11	0.139	0.187	0.278	0.373	0.561	1.007	1.415
558A	0.207	0.302	0.355	0.416	0.52	0.698	1.031	1.355	2.207	OVER	OVER
558B	0.208	0.308	0.36	0.426	0.533	0.72	1.078	1.417	2.257	OVER	OVER
C558	0.11	0.125	0.135	0.153	0.18	0.727	0.328	0.454	0.934	2.534	OVER
559A	0.101	0.125	0.144	0.18	0.251	0.358	0.52	0.657	0.922	1.375	1.308
559B	0.115	0.154	0.159	0.212	0.284	0.381	0.571	0.692	0.981	1.399	1.323
C559	0.114	0.13	0.141	0.16	0.19	0.239	0.325	0.406	0.589	1.054	1.428

Run ID	0	0.25	0.5	1	2	4	8	12	24	48	72
560A	0.256	0.355	0.407	0.471	0.526	0.752	1.075	1.423	2.265	OVER	OVER
560B	0.255	0.352	0.403	0.468	0.571	0.744	1.066	1.4	2.242	OVER	OVER
C560	0.146	0.16	0.169	0.185	0.211	0.255	0.35	0.471	0.926	2.465	OVER
561a	0.035	0.037	0.039	0.048	0.061	0.105	0.158	0.197	0.245	0.337	0.409
561B	0.041	0.058	0.065	0.075	0.078	0.132	0.188	0.211	0.266	0.349	0.419
C561	0.046	0.051	0.046	0.046	0.044	0.049	0.073	0.097	0.087	0.118	0.15
562A	0.127	0.197	0.253	0.341	0.427	0.543	0.698	0.784	0.965	1.298	1.579
562B	0.096	0.177	0.238	0.325	0.407	0.535	0.691	0.792	0.951	1.309	1.607
C562	0.045	0.047	0.048	0.053	0.058	0.067	0.072	0.078	0.089	0.122	0.159
563A	0.064	0.068	0.075	0.082	0.097	0.135	0.191	0.231	0.281	0.386	0.475
563B	0.082	0.089	0.092	0.095	0.112	0.16	0.21	0.244	0.304	0.408	0.488
C563	0.069	0.068	0.07	0.072	0.075	0.082	0.09	0.093	0.11	0.151	0.197
564A	0.13	0.208	0.267	0.353	0.43	0.54	0.691	0.811	0.982	1.341	1.661
564B	0.148	0.224	0.28	0.366	0.442	0.555	0.705	0.819	0.988	1.278	1.563
C564	0.101	0.1	0.113	0.108	0.112	0.131	0.135	0.128	0.135	0.152	0.186
565A	0.043	0.045	0.052	0.068	0.095	0.15	0.212	0.252	0.301	0.417	0.521
565B	0.039	0.043	0.048	0.063	0.091	0.144	0.205	0.244	0.294	0.412	0.518
C565	0.038	0.04	0.04	0.044	0.048	0.053	0.067	0.076	0.093	0.138	0.183
566A	0.182	0.288	0.34	0.405	0.481	0.597	0.718	0.793	0.934	1.332	1.72
566B	0.183	0.284	0.335	0.399	0.479	0.599	0.725	0.801	0.925	1.332	1.72
C566	0.087	0.091	0.093	0.1	0.106	0.112	0.119	0.128	0.148	0.212	0.295
567A	0.107	0.117	0.108	0.124	0.157	0.219	0.263	0.3	0.349	0.447	0.574
567B	0.091	0.094	0.099	0.115	0.146	0.2	0.258	0.289	0.342	0.456	0.591
C567	0.077	0.079	0.078	0.083	0.086	0.093	0.103	0.111	0.127	0.18	0.236
568A	0.24	0.339	0.389	0.453	0.528	0.644	0.754	0.831	0.977	1.378	1.735
568B	0.235	0.334	0.385	0.448	0.522	0.637	0.75	0.829	0.97	1.373	1.735
C568	0.137	0.137	0.14	0.146	0.152	0.151	0.164	0.164	0.182	0.243	0.324
569A	0.038	0.043	0.051	0.067	0.094	0.141	0.214	0.25	0.297	0.32	0.336
569B	0.038	0.042	0.049	0.064	0.092	0.138	0.206	0.243	0.29	0.313	0.328
C569	0.038	0.038	0.041	0.044	0.047	0.049	0.059	0.063	0.071	0.079	0.087
570A	0.13	0.249	0.354	0.462	0.571	0.742	1.057	1.138	1.228	1.293	1.346
570B	0.13	0.255	0.36	0.473	0.58	0.741	1.045	1.147	1.233	1.3	1.353
C570	0.059	0.048	0.052	0.063	0.064	0.071	0.079	0.081	0.087	0.091	0.095
571A	0.083	0.087	0.099	0.114	0.139	0.185	0.257	0.293	0.346	0.365	0.378
571B	0.082	0.087	0.095	0.11	0.135	0.181	0.249	0.288	0.336	0.359	0.373
C571	0.079	0.079	0.082	0.083	0.086	0.088	0.096	0.098	0.103	0.112	0.124
572A	0.177	0.294	0.394	0.501	0.605	0.765	1.068	1.178	1.266	1.3	1.344
572B	0.181	0.299	0.401	0.512	0.62	0.786	1.101	1.194	1.304	1.363	1.417
C572	0.102	0.104	0.108	0.112	0.119	0.125	0.13	0.13	0.134	0.129	0.135
573A	0.063	0.054	0.1	0.092	0.148	0.188	0.246	0.269	0.327	0.318	0.333
573B	0.049	0.052	0.065	0.089	0.129	0.185	0.242	0.265	0.296	0.314	0.327
C573	0.042	0.046	0.046	0.05	0.054	0.057	0.065	0.07	0.078	0.089	0.098
574A	0.248	0.412	0.507	0.598	0.697	0.854	1.019	1.065	1.106	1.167	1.216
574B	0.24	0.402	0.498	0.58	0.689	0.858	1.03	1.068	1.101	1.163	1.223
C574	0.087	0.093	0.099	0.104	0.11	0.115	0.121	0.122	0.127	0.135	0.143
575A	0.104	0.11	0.122	0.147	0.188	0.245	0.306	0.33	0.351	0.373	0.392
575B	0.092	0.099	0.112	0.137	0.18	0.239	0.299	0.321	0.349	0.372	0.388
C575	0.094	0.094	0.097	0.098	0.102	0.106	0.113	0.117	0.118	0.13	0.141
576A	0.297	0.454	0.55	0.631	0.737	0.892	1.041	1.103	1.162	1.212	1.269
576B	0.304	0.454	0.547	0.629	0.733	0.888	1.051	1.096	1.163	1.206	1.262
C576	0.136	0.14	0.146	0.151	0.158	0.161	0.166	0.165	0.16	0.169	0.175
577A	0.041	0.045	0.053	0.07	0.094	0.149	0.205	0.254	0.305	0.347	0.368
577B	0.04	0.045	0.054	0.07	0.093	0.15	0.209	0.256	0.31	0.352	0.378
C577	0.041	0.044	0.046	0.049	0.054	0.065	0.069	0.076	0.09	0.111	0.127
578A	0.11	0.207	0.288	0.423	0.479	0.67	0.919	1.029	1.126	1.223	1.292
578B	0.106	0.205	0.292	0.385	0.472	0.672	0.923	1.039	1.14	1.228	1.302
C578	0.048	0.051	0.055	0.061	0.067	0.075	0.08	0.084	0.089	0.102	0.111
579A	0.069	0.075	0.084	0.102	0.123	0.178	0.238	0.283	0.34	0.39	0.414
579B	0.073	0.078	0.085	0.102	0.126	0.184	0.243	0.288	0.344	0.395	0.425
C579	0.077	0.081	0.082	0.087	0.09	0.099	0.108	0.115	0.126	0.152	0.172
580A	0.159	0.257	0.34	0.429	0.51	0.719	0.955	1.077	1.172	1.263	1.331
580B	0.156	0.253	0.34	0.431	0.516	0.727	0.971	1.095	1.203	1.286	1.34
C580	0.102	0.106	0.11	0.115	0.12	0.13	0.134	0.138	0.148	0.151	0.162
581A	0.046	0.056	0.068	0.09	0.126	0.192	0.246	0.276	0.31	0.342	0.363
581B	0.046	0.056	0.067	0.093	0.127	0.196	0.248	0.279	0.312	0.345	0.368
C581	0.043	0.048	0.051	0.054	0.058	0.067	0.076	0.084	0.097	0.115	0.131
582A	0.209	0.344	0.424	0.497	0.577	0.754	0.896	0.956	1.002	1.091	1.17
582B	0.21	0.343	0.426	0.499	0.579	0.762	0.903	0.967	1.017	1.094	1.172
C582	0.093	0.098	0.101	0.109	0.114	0.122	0.127	0.128	0.132	0.148	0.162
583A	0.09	0.099	0.113	0.138	0.173	0.242	0.294	0.327	0.361	0.398	0.426
583B	0.099	0.105	0.118	0.144	0.181	0.25	0.303	0.333	0.364	0.404	0.431
C583	0.111	0.115	0.12	0.121	0.125	0.134	0.151	0.153	0.169	0.187	0.204
584A	0.276	0.4	0.479	0.55	0.629	0.807	0.938	0.997	1.064	1.146	1.231
584B	0.274	0.401	0.479	0.547	0.627	0.81	0.946	1.009	1.073	1.159	1.245
C584	0.138	0.143	0.148	0.154	0.16	0.167	0.169	0.17	0.174	0.192	0.207

Appendix V. 418 nm Spectrophotometric Study Response Values

418 nm data average "response" measurements

	Tmax	Amax	Tmin	Amin	Amax-Amin	Tmax-Tmin	Settling Rate
9	12	0.178	0.25	0.031	0.147	11.75	0.485
10	2	1.267	72	0.141	1.126	-70	0.655
11	12	0.212	0.25	0.052	0.16	11.75	0.515
12	1	1.35	48	0.182	1.168	-47	0.505
13	12	0.201	0.25	0.04	0.161	11.75	0.5
14	1	1.172	72	0.196	0.976	-71	0.485
15	12	0.186	0.25	0.041	0.145	11.75	0.395
16	1	1.152	72	0.192	0.96	-71	0.48
17	4	0.216	72	0.025	0.191	-68	1.075
18	1	0.975	72	0.093	0.882	-71	0.805
19	12	0.222	72	0.038	0.184	-60	0.95
20	1	1.183	72	0.139	1.044	-71	0.68
21	4	0.234	72	0.026	0.208	-68	0.97
22	1	1.149	72	0.14	1.009	-71	0.68
23	8	0.213	72	0.039	0.174	-64	0.95
24	1	1.076	72	0.159	0.917	-71	0.61
25	8	0.24	72	0.045	0.195	-64	1.095
26	0.5	1.503	72	0.164	1.339	-71.5	0.635
27	8	0.269	72	0.049	0.22	-64	1.055
28	0.25	1.753	72	0.185	1.568	-71.75	0.62
29	8	0.259	72	0.042	0.217	-64	1.15
30	0.5	1.523	72	0.178	1.345	-71.5	0.58
31	12	0.252	72	0.046	0.206	-60	1.05
32	0.5	1.331	72	0.208	1.123	-71.5	0.565
33	4	0.235	72	0.041	0.194	-68	0.93
34	0.5	1.081	72	0.127	0.954	-71.5	0.685
35	4	0.249	72	0.073	0.176	-68	0.785
36	0.5	1.354	72	0.173	1.181	-71.5	0.645
37	4	0.286	72	0.056	0.23	-68	0.845
38	0.5	1.283	72	0.148	1.135	-71.5	0.65
39	8	0.235	72	0.037	0.198	-64	0.925
40	0.5	1.241	72	0.194	1.047	-71.5	0.585
41	0.25	0.044	72	0.013	0.031	-71.75	0.19
42	1	4	72	0.025	3.975	-71	1.635
43	12	0.781	72	0.071	0.71	-60	1.32
44	2	4	72	0.236	3.764	-70	1.525
45	0.25	0.051	72	0.015	0.036	-71.75	*
46	1	2.966	72	0.034	2.932	-71	1.195
47	12	0.821	72	0.046	0.775	-60	1.595
48	1	2.999	72	0.032	2.967	-71	1.25
49	0.5	0.077	72	0.025	0.052	-71.5	0.135
50	2	4	72	0.111	3.889	-70	1.39
51	4	0.679	72	0.069	0.61	-68	0.91
52	2	4	72	0.612	3.388	-70	0.51
53	0.5	0.071	72	0.024	0.047	-71.5	*
54	1	2.709	72	0.125	2.584	-71	0.705
55	4	0.612	72	0.073	0.539	-68	0.815
56	1	2.787	72	0.144	2.643	-71	0.75
57	2	1.671	72	0.01	1.661	-70	1.15
58	2	4	72	0.663	3.337	-70	1.14
59	8	0.938	72	0.084	0.854	-64	1.165
60	1	4	72	1.143	2.857	-71	0.325
61	2	1.667	72	0.009	1.658	-70	1.985
62	0.5	4	72	0.051	3.949	-71.5	0.785
63	4	1.734	72	0.057	1.677	-68	1.21
64	0.5	4	72	0.848	3.152	-71.5	0.165
65	2	1.69	72	0.019	1.671	-70	1.61
66	2	4	72	1.258	2.742	-70	*
67	4	0.82	72	0.151	0.669	-68	0.665
68	1	4	72	1.026	2.974	-71	0.325
69	2	1.713	72	0.025	1.688	-70	1.595
70	1	3.041	72	0.526	2.515	-71	0.43
71	4	0.82	72	0.1	0.72	-68	0.835
72	1	3.159	72	1.367	1.792	-71	*
73	8	0.264	72	0.042	0.222	-64	1.06
74	1	1.266	72	0.093	1.173	-71	0.91
75	4	0.261	72	0.039	0.222	-68	0.985
76	1	1.261	72	0.115	1.146	-71	0.79
77	0.25	0.033	72	0.007	0.026	-71.75	*
78	1	4	72	0.016	3.984	-71	2.04
79	2	0.081	72	0.027	0.054	-70	0.19
80	1	4	72	1.637	2.363	-71	0.125
81	8	1.01	72	0.01	1	-64	2.05
82	1	4	72	0.026	3.974	-71	1.425
83	4	0.992	72	0.073	0.919	-68	1.28
84	1	4	72	0.332	3.668	-71	0.685
85	8	1.617	72	0.014	1.603	-64	2.11
86	1	4	72	0.425	3.575	-71	0.66
87	4	1.32	72	0.013	1.307	-68	1.825
88	1	4	72	0.607	3.393	-71	0.355
89	4	0.894	72	0.028	0.866	-68	1.9
90	1	4	72	0.022	3.978	-71	1.965
91	4	0.986	72	0.034	0.952	-68	1.49
92	1	4	72	0.332	3.668	-71	0.58
93	1	0.039	72	0.031	0.008	-71	*
94	72	2.684	0.25	0.042	2.642	71.75	-0.325
95	0.25	0.089	72	0.044	0.045	-71.75	0.215
96	48	4	0.25	0.092	3.908	47.75	-0.38
97	4	0.039	0.25	0.035	0.004	3.75	*
98	72	2.432	0.25	0.091	2.341	71.75	-0.29
99	0.25	0.088	72	0.049	0.039	-71.75	0.18
100	48	3.438	0.25	0.132	3.306	47.75	-0.21
101	12	0.139	0.25	0.013	0.126	11.75	0.82
102	2	1.893	72	0.084	1.809	-70	1.145
103	12	0.198	72	0.025	0.173	-60	1.025
104	1	1.904	72	0.082	1.822	-71	1.05
105	8	0.177	0.25	0.017	0.16	7.75	0.89
106	1	2.229	72	0.094	2.135	-71	0.805
107	8	0.221	0.25	0.047	0.174	7.75	0.89
108	1	2.275	72	0.108	2.167	-71	0.79
109	72	0.023	0.25	0.015	0.008	71.75	*
110	72	4	0.25	0.035	3.965	71.75	-0.885
111	1	0.041	72	0.014	0.027	-71	0.36
112	12	4	0.25	0.064	3.936	11.75	-0.11
113	8	0.226	0.25	0.018	0.208	7.75	1.09
114	2	3.313	72	0.13	3.183	-70	0.735
115	8	0.276	72	0.028	0.248	-64	1.11
116	1	3.124	72	0.08	3.044	-71	1.015
117	8	0.675	0.25	0.048	0.627	7.75	0.335
118	72	4	0.25	2.226	1.774	71.75	*
119	8	0.685	0.25	0.095	0.59	7.75	0.315
120	72	4	0.25	2.309	1.691	71.75	*
121	8	1.532	0.25	0.067	1.465	7.75	0.275
122	72	4	0.25	3.176	0.824	71.75	*
123	8	1.512	0.25	0.105	1.407	7.75	0.215
124	72	4	0.25	3.259	0.741	71.75	*
125	12	0.8	0.25	0.034	0.766	11.75	0.295
126	12	4	0.25	1.981	2.019	11.75	*
127	12	0.782	0.25	0.07	0.712	11.75	0.15
128	12	4	0.25	2.091	1.909	11.75	*
129	12	1.55	0.25	0.046	1.504	11.75	0.11
130	4	4	72	0.371	3.629	-68	0.79
131	24	1.513	0.25	0.089	1.424	23.75	*
132	4	4	72	0.509	3.491	-68	0.735
133	4	0.58	0.25	0.055	0.525	3.75	0.28
134	72	4	72	2.75	1.25	0	*
135	4	0.64	0.25	0.086	0.554	3.75	0.215
136	72	4	72	2.898	1.102	0	*
137	8	0.778	0.25	0.039	0.739	7.75	0.275
138	72	4	0.25	3.178	0.822	71.75	*
139	8	0.762	0.25	0.077	0.685	7.75	0.155
140	72	4	0.25	3.298	0.702	71.75	*
141	72	0.859	0.25	0.061	0.798	71.75	0.82
142	4	4	72	0.17	3.83	-68	1.145
143	72	0.885	0.25	0.093	0.792	71.75	1.025
144	4	4	72	0.117	3.883	-68	1.05
145	48	0.89	0.25	0.105	0.785	47.75	0.89
146	2	4	72	0.148	3.852	-70	0.805
147	48	0.914	0.25	0.147	0.767	47.75	0.89
148	2	4	72	0.159	3.841	-70	0.79
149	48	1.045	0.25	0.071	0.974	47.75	-0.255
150	1	3.469	72	0.16	3.309	-71	0.85
151	48	0.948	0.25	0.105	0.843	47.75	-0.235
152	1	4	72	0.162	3.838	-71	0.83
153	48	1.478	0.25	0.087	1.391	47.75	-0.43
154	1	4	72	0.197	3.803	-71	0.89
155	72	1.658	0.25	0.183	1.475	71.75	-0.345
156	2	4	72	0.253	3.747	-70	0.93
157	24	0.967	0.25	0.073	0.894	23.75	1.09
158	0.5	4	72	0.117	3.883	-71.5	0.735

418 nm data average "response" measurements

	Tmax	Amax	Tmin	Amin	Amax-Amin	Tmax-Tmin	Settling Rate
159	24	0.969	0.25	0.123	0.846	23.75	1.11
160	0.5	4	72	0.32	3.68	-71.5	1.015
161	24	0.991	0.25	0.092	0.899	23.75	0.16
162	4	4	72	1.188	2.812	-68	0.93
163	24	0.982	0.25	0.132	0.85	23.75	0.06
164	4	4	72	2.864	1.136	-68	*
165	12	0.249	72	0.054	0.195	-60	0.97
166	1	1.287	72	0.133	1.154	-71	0.735
167	8	0.246	72	0.0499	0.1961	-64	0.845
168	1	1.301	72	0.146	1.155	-71	0.67
169	12	0.74	72	0.082	0.658	-60	*
170	4	4	72	0.594	3.406	-68	2.04
171	4	0.664	72	0.112	0.552	-68	*
172	2	4	72	1.228	2.772	-70	0.125
173	72	1.146	0.25	0.127	1.019	71.75	-0.36
174	4	4	72	0.677	3.323	-68	0.915
175	72	0.967	0.25	0.174	0.793	71.75	*
176	2	4	72	0.65	3.35	-70	0.625
177	72	1.237	72	0.16	1.077	0	-0.26
178	2	4	72	1.199	2.801	-70	0.105
179	72	1.389	0.25	0.216	1.173	71.75	-0.28
180	2	4	72	1.262	2.738	-70	*
181	24	0.915	0.25	0.15	0.765	23.75	0.43
182	4	4	72	0.085	3.915	-68	*
183	24	0.927	0.25	0.192	0.735	23.75	0.8
184	2	4	72	0.408	3.592	-70	0.495
185	72	0.361	0.25	0.034	0.327	71.75	-0.535
186	72	1.423	0.25	0.126	1.297	71.75	-0.03
187	72	0.451	0.25	0.101	0.35	71.75	-0.285
188	72	1.589	0.25	0.219	1.37	71.75	-0.07
189	72	0.333	0.25	0.032	0.301	71.75	-0.13
190	72	1.349	0.25	0.329	1.02	71.75	-0.03
191	72	0.466	0.25	0.097	0.369	71.75	-0.385
192	72	1.435	0.25	0.425	1.01	71.75	-0.035
193	24	0.174	0.25	0.019	0.155	23.75	-0.105
194	2	2.096	72	0.103	1.993	-70	0.985
195	72	0.212	0.25	0.043	0.169	71.75	-0.19
196	2	2.09	72	0.095	1.995	-70	0.87
197	72	0.191	0.25	0.026	0.165	71.75	-0.07
198	1	2.289	72	0.128	2.161	-71	0.765
199	72	0.247	0.25	0.063	0.184	71.75	-0.095
200	1	2.296	72	0.127	2.169	-71	0.72
201	72	0.51	0.25	0.02	0.49	71.75	-0.255
202	12	3.152	0.25	0.233	2.919	11.75	0.035
203	72	0.57	0.25	0.056	0.514	71.75	-0.23
204	12	3.279	0.25	0.288	2.991	11.75	0.04
205	48	0.469	0.25	0.024	0.445	47.75	-0.195
206	2	4	72	0.178	3.822	-70	0.685
207	24	0.449	0.25	0.057	0.392	23.75	*
208	1	3.316	72	0.132	3.184	-71	0.655
209	24	0.893	0.25	0.139	0.754	23.75	0.04
210	8	4	0.25	2.23	1.77	7.75	*
211	24	0.827	0.25	0.184	0.643	23.75	*
212	72	4	0.25	2.287	1.713	71.75	*
213	48	1.65	0.25	0.185	1.465	47.75	-0.005
214	72	4	0.25	4	0	71.75	*
215	48	1.534	0.25	0.226	1.308	47.75	-0.155
216	72	4	0.25	4	0	71.75	*
217	72	0.891	0.25	0.054	0.837	71.75	-0.325
218	72	4	0.25	1.868	2.132	71.75	-0.66
219	72	0.819	0.25	0.083	0.736	71.75	-0.35
220	72	4	0.25	1.846	2.154	71.75	-0.51
221	72	1.316	0.25	0.073	1.243	71.75	-0.365
222	12	4	72	1.063	2.937	-60	*
223	72	1.332	0.25	0.11	1.222	71.75	-0.385
224	12	4	72	1.048	2.952	-60	*
225	12	0.929	0.25	0.149	0.78	11.75	-0.27033
226	72	4	0.25	3.223	0.777	71.75	*
227	12	0.931	0.25	0.205	0.726	11.75	0.11
228	72	4	0.25	3.264	0.736	71.75	*
229	24	0.935	0.25	0.066	0.869	23.75	0.045
230	72	4	0.25	3.463	0.537	71.75	*
231	24	0.898	0.25	0.088	0.81	23.75	*
232	72	4	0.25	3.376	0.624	71.75	*
233	72	0.473	0.25	0.055	0.418	71.75	-0.105
234	4	4	72	0.156	3.844	-68	0.985
235	72	0.55	0.25	0.081	0.469	71.75	-0.19
236	4	4	72	0.25	3.75	-68	0.87
237	72	0.523	0.25	0.074	0.449	71.75	-0.07
238	2	4	72	0.2	3.8	-70	0.765
239	72	0.577	0.25	0.11	0.467	71.75	-0.095
240	2	4	72	0.222	3.778	-70	0.72
241	72	0.513	0.25	0.067	0.446	71.75	-0.175
242	2	4	72	0.193	3.807	-70	0.805
243	72	0.557	0.25	0.086	0.471	71.75	-0.195
244	2	4	72	0.189	3.811	-70	0.955
245	72	0.57	0.25	0.095	0.475	71.75	-0.145
246	2	4	72	0.244	3.756	-70	0.855
247	72	0.582	0.25	0.12	0.462	71.75	-0.15
248	2	4	72	0.222	3.778	-70	0.845
249	72	1.031	0.25	0.07	0.961	71.75	-0.195
250	2	4	72	0.198	3.802	-70	0.685
251	72	1.041	0.25	0.109	0.932	71.75	*
252	2	4	72	0.769	3.231	-70	0.655
253	72	1.129	0.25	0.073	1.056	71.75	-0.24
254	2	4	72	0.198	3.802	-70	1.605
255	72	1.115	0.25	0.106	1.009	71.75	-0.265
256	2	4	72	0.725	3.275	-70	0.705
257	12	0.202	72	0.028	0.174	-60	1.13
258	1	0.974	72	0.091	0.883	-71	0.825
259	4	0.21	72	0.028	0.182	-68	0.945
260	0.5	1.015	72	0.115	0.9	-71.5	0.73
261	1	0.03	72	0.006	0.024	-71	*
262	1	3.415	72	0.063	3.352	-71	1.1
263	0.25	0.062	72	0.029	0.033	-71.75	0.11
264	1	4	72	1.251	2.749	-71	0.51
265	4	0.981	72	0.063	0.918	-68	1.265
266	2	2.108	72	0.088	2.02	-70	0.9
267	4	0.861	72	0.022	0.839	-68	1.23
268	1	1.606	72	0.138	1.468	-71	0.665
269	8	1.067	72	0.046	1.021	-64	1.635
270	2	2.483	72	0.422	2.061	-70	0.27
271	4	1.003	72	0.027	0.976	-68	1.575
272	1	1.628	72	0.426	1.202	-71	0.175
273	4	0.813	72	0.043	0.77	-68	1.08
274	1	2.593	72	0.039	2.554	-71	1.165
275	4	0.893	72	0.027	0.866	-68	1.19
276	1	1.771	72	0.078	1.693	-71	0.915
277	0.25	0.035	72	0.024	0.011	-71.75	0.105
278	4	1.89	72	0.048	1.842	-68	1.45
279	0.25	0.066	72	0.032	0.034	-71.75	0.175
280	4	1.402	72	0.054	1.348	-68	1.23
281	2	0.035	72	0.031	0.004	-70	*
282	8	2.33	72	0.095	2.235	-64	1.155
283	0.25	0.104	72	0.061	0.043	-71.75	*
284	8	1.928	72	0.137	1.791	-64	1.215
285	24	0.094	0.25	0.013	0.081	23.75	0.64
286	1	1.191	72	0.059	1.132	-71	0.995
287	8	0.169	72	0.037	0.132	-64	0.82
288	1	1.206	72	0.073	1.133	-71	0.695
289	12	0.129	0.25	0.018	0.111	11.75	0.92
290	0.5	1.442	72	0.083	1.359	-71.5	0.85
291	8	0.201	72	0.039	0.162	-64	0.8
292	0.5	1.486	72	0.093	1.393	-71.5	0.68
293	72	0.029	72	0.015	0.014	0	-0.22
294	4	1.689	0.25	0.098	1.591	3.75	0.98
295	0.25	0.065	72	0.038	0.027	-71.75	*
296	4	1.343	72	0.127	1.216	-68	0.895
297	8	0.198	0.25	0.023	0.175	7.75	0.73
298	1	1.609	72	0.133	1.476	-71	0.6
299	8	0.241	72	0.03	0.211	-64	1.03
300	1	1.641	72	0.136	1.505	-71	0.46
301	8	0.753	0.25	0.048	0.705	7.75	0.27
302	72	4	0.25	1.716	2.284	71.75	*
303	12	0.772	0.25	0.086	0.686	11.75	0.2
304	72	4	0.25	1.892	2.108	71.75	*
305	12	1.556	0.25	0.066	1.49	11.75	0.25
306	72	4	0.25	2.935	1.065	71.75	*
307	12	1.528	0.25	0.114	1.414	11.75	0.11
308	72	4	0.25	3.121	0.879	71.75	*
309	12	0.764	0.25	0.034	0.73	11.75	0.315
310	4	4	0.25	1.426	2.574	3.75	0.5
311	12	0.79	0.25	0.049	0.741	11.75	0.12
312	2	4	72	0.14	3.86	-70	0.97
313	24	1.58	0.25	0.056	1.524	23.75	0.155
314	2	4	72	0.515	3.485	-70	0.48

418 nm data average "response" measurements

	Tmax	Amax	Tmin	Amin	Amax-Amin	Tmax-Tmin	Settling Rate
315	24	1.529	0.25	0.059	1.47	23.75	*
316	2	4	72	0.557	3.443	-70	0.325
317	8	0.587	0.25	0.05	0.537	7.75	0.31
318	8	4	72	2.532	1.468	-64	0.035
319	8	0.66	0.25	0.081	0.579	7.75	0.48
320	8	4	0.25	2.643	1.357	7.75	*
321	8	0.801	0.25	0.046	0.755	7.75	0.31
322	1	4	72	0.098	3.902	-71	0.74
323	8	0.762	0.25	0.063	0.699	7.75	0.245
324	1	4	72	0.05	3.95	-71	0.71
325	48	0.814	0.25	0.05	0.764	47.75	0.64
326	2	4	72	0.133	3.867	-70	0.995
327	72	0.899	0.25	0.083	0.816	71.75	0.82
328	4	4	72	0.158	3.842	-68	0.695
329	48	0.942	0.25	0.104	0.838	47.75	0.92
330	2	4	72	0.186	3.814	-70	0.85
331	48	0.973	0.25	0.149	0.824	47.75	0.8
332	2	4	72	0.176	3.824	-70	0.68
333	48	1.01	0.25	0.068	0.942	47.75	-0.19
334	2	2.724	72	0.115	2.609	-70	0.89
335	48	1.008	0.25	0.109	0.899	47.75	-0.23
336	2	2.457	72	0.133	2.324	-70	0.94
337	72	1.782	0.25	0.135	1.647	71.75	-0.42
338	1	4	72	0.18	3.82	-71	0.775
339	72	1.62	0.25	0.202	1.418	71.75	-0.35
340	4	4	72	0.282	3.718	-68	1.045
341	24	1.113	0.25	0.121	0.992	23.75	0.73
342	1	4	72	0.114	3.886	-71	0.6
343	24	0.902	0.25	0.136	0.766	23.75	1.03
344	1	4	72	0.235	3.765	-71	0.46
345	24	1.053	0.25	0.171	0.882	23.75	0.12
346	1	4	72	0.116	3.884	-71	0.76
347	24	0.975	0.25	0.142	0.833	23.75	0.05
348	1	4	72	0.234	3.766	-71	1.27
349	12	0.188	0.25	0.05	0.138	11.75	0.705
350	1	0.894	72	0.116	0.778	-71	0.695
351	8	0.177	72	0.036	0.141	-64	0.84
352	1	0.916	72	0.131	0.785	-71	0.65
353	4	0.586	72	0.046	0.54	-68	0.875
354	1	3.441	72	1.085	2.356	-71	*
355	4	0.569	72	0.049	0.52	-68	0.755
356	1	3.348	72	0.932	2.416	-71	0.12
357	72	0.565	0.25	0.091	0.474	71.75	-0.23
358	2	2.208	72	0.448	1.76	-70	0.395
359	72	0.681	0.25	0.152	0.529	71.75	-0.225
360	1	1.604	72	0.46	1.144	-71	0.31
361	72	0.693	0.25	0.121	0.572	71.75	-0.24
362	2	2.349	72	0.446	1.903	-70	-0.12
363	72	0.743	0.25	0.161	0.582	71.75	-0.225
364	1	1.94	72	0.383	1.557	-71	-0.15
365	72	1.171	0.25	0.133	1.038	71.75	-0.33
366	2	2.949	72	0.121	2.828	-70	0.845
367	72	1.14	0.25	0.172	0.968	71.75	-0.285
368	1	2.169	72	0.111	2.058	-71	0.81
369	72	0.19	0.25	0.035	0.155	71.75	-0.15
370	12	2.114	72	0.105	2.009	-60	1.935
371	72	0.254	0.25	0.076	0.178	71.75	-0.16
372	12	2.089	72	0.101	1.988	-60	1.86
373	72	0.166	0.25	0.032	0.134	71.75	-0.29
374	12	2.129	72	0.181	1.948	-60	1.515
375	72	0.248	0.25	0.085	0.163	71.75	-0.22
376	12	2.102	72	0.139	1.963	-60	1.45
377	72	0.251	0.25	0.023	0.228	71.75	-0.18
378	1	1.076	72	0.097	0.979	-71	0.67
379	24	0.244	0.25	0.059	0.185	23.75	*
380	1	1.08	72	0.112	0.968	-71	0.515
381	48	0.264	0.25	0.035	0.229	47.75	-0.085
382	0.5	1.247	72	0.1	1.147	-71.5	0.715
383	24	0.28	0.25	0.086	0.194	23.75	0.205
384	0.5	1.325	72	0.108	1.217	-71.5	0.555
385	72	0.212	0.25	0.024	0.188	71.75	-0.46
386	4	4	72	1.031	2.969	-68	0.505
387	72	0.235	0.25	0.063	0.172	71.75	-0.305
388	4	4	72	0.41	3.59	-68	0.68
389	24	0.398	0.25	0.033	0.365	23.75	0.96
390	0.5	1.672	72	0.18	1.492	-71.5	0.47
391	12	0.394	72	0.07	0.324	-60	0.98
392	0.5	1.664	72	0.151	1.513	-71.5	0.3
393	24	0.936	0.25	0.137	0.799	23.75	0.085

	Tmax	Amax	Tmin	Amin	Amax-Amin	Tmax-Tmin	Settling Rate
394	4	4	0.25	1.658	2.342	3.75	*
395	24	0.911	0.25	0.196	0.715	23.75	*
396	4	4	0.25	1.75	2.25	3.75	*
397	24	1.806	0.25	0.202	1.604	23.75	-0.285
398	4	4	0.25	2.69	1.31	3.75	*
399	24	1.776	0.25	0.265	1.511	23.75	-0.1
400	4	4	0.25	2.799	1.201	3.75	*
401	72	0.961	0.25	0.05	0.911	71.75	-0.465
402	12	4	0.25	1.522	2.478	11.75	*
403	72	0.855	0.25	0.091	0.764	71.75	-0.41
404	12	4	0.25	1.589	2.411	11.75	*
405	72	1.194	0.25	0.068	1.126	71.75	-0.46
406	8	4	72	0.511	3.489	-64	0.29
407	72	1.407	0.25	0.101	1.306	71.75	-0.46
408	8	4	72	0.493	3.507	-64	0.48
409	12	0.963	0.25	0.135	0.828	11.75	0.15
410	8	4	0.25	2.774	1.226	7.75	*
411	12	0.938	0.25	0.176	0.762	11.75	0.14
412	8	4	0.25	2.857	1.143	7.75	*
413	24	0.942	0.25	0.065	0.877	23.75	0.175
414	8	4	0.25	2.785	1.215	7.75	*
415	24	0.894	0.25	0.099	0.795	23.75	*
416	8	4	0.25	2.9	1.1	7.75	*
417	72	0.516	0.25	0.061	0.455	71.75	-0.18
418	4	4	72	0.182	3.818	-68	0.67
419	72	0.579	0.25	0.099	0.48	71.75	*
420	4	4	72	0.183	3.817	-68	0.515
421	72	0.555	0.25	0.078	0.477	71.75	-0.085
422	4	4	72	0.234	3.766	-68	0.715
423	72	0.614	0.25	0.119	0.495	71.75	0.205
424	2	4	72	0.225	3.775	-70	0.555
425	72	0.455	0.25	0.085	0.37	71.75	-0.17
426	4	4	72	0.192	3.808	-68	1.175
427	72	0.524	0.25	0.127	0.397	71.75	-0.2
428	4	4	72	0.172	3.828	-68	1.19
429	72	0.483	0.25	0.108	0.375	71.75	-0.13
430	4	4	72	0.242	3.758	-68	1.085
431	72	0.525	0.25	0.139	0.386	71.75	-0.13
432	4	4	72	0.269	3.731	-68	0.95
433	72	0.721	0.25	0.078	0.643	71.75	0.96
434	1	4	72	0.214	3.786	-71	0.47
435	72	0.814	0.25	0.113	0.701	71.75	0.98
436	1	4	72	0.216	3.784	-71	0.3
437	72	0.889	0.25	0.092	0.797	71.75	-0.19
438	4	4	72	0.217	3.783	-68	1.325
439	72	0.885	0.25	0.116	0.769	71.75	-0.21
440	2	4	72	0.228	3.772	-70	0.955
441	12	0.216	72	0.05	0.166	-60	1.56
442	2	1.17	72	0.052	1.118	-70	1.3
443	4	0.193	72	0.027	0.166	-68	1.125
444	2	1.177	72	0.068	1.109	-70	1.12
445	8	0.196	72	0.021	0.175	-64	*
446	1	1.32	72	0.118	1.202	-71	0.88
447	4	0.216	72	0.035	0.181	-68	*
448	1	1.288	72	0.108	1.18	-71	0.81
449	0.25	0.029	72	0.006	0.023	-71.75	*
450	4	4	72	0.024	3.976	-68	2.02
451	0.25	0.067	72	0.026	0.041	-71.75	*
452	2	4	72	0.048	3.952	-70	1.73
453	4	0.427	0.25	0.034	0.393	3.75	*
454	2	4	72	0.5399	3.4601	-70	0.8
455	4	0.34	0.25	0.017	0.323	3.75	1.165
456	1	4	72	0.386	3.614	-71	*
457	4	0.737	0.25	0.049	0.688	3.75	0.825
458	4	2.626	72	0.029	2.597	-68	1.315
459	4	0.74	72	0.019	0.721	-68	1.715
460	2	1.965	72	0.03	1.935	-70	1.305
461	8	1.358	72	0.066	1.292	-64	1.985
462	4	2.168	72	0.222	1.946	-68	0.75
463	8	1.432	72	0.063	1.369	-64	1.675
464	2	1.799	72	0.158	1.641	-70	0.72
465	4	0.029	72	0.027	0.002	-68	0.03
466	72	0.66	0.25	0.045	0.615	71.75	-0.61
467	0.25	0.074	72	0.036	0.038	-71.75	0.155
468	72	1.415	0.25	0.105	1.31	71.75	-0.57
469	72	0.031	72	0.028	0.003	0	*
470	72	1.022	0.25	0.084	0.938	71.75	-0.59
471	0.25	0.093	72	0.051	0.042	-71.75	0.23
472	72	1.372	0.25	0.128	1.244	71.75	-0.445

418 nm data average "response" measurements

	Tmax	Amax	Tmin	Amin	Amax-Amin	Tmax-Tmin	Settling Rate
473	12	0.08	72	0.01	0.07	-60	1.22
474	2	1.617	72	0.054	1.563	-70	1.165
475	12	0.143	72	0.018	0.125	-60	0.875
476	2	1.582	72	0.113	1.469	-70	0.95
477	8	0.124	72	0.024	0.1	-64	0.93
478	2	1.91	72	0.073	1.837	-70	0.935
479	8	0.178	72	0.022	0.156	-64	0.94
480	1	1.871	72	0.09	1.781	-71	0.82
481	12	0.6	0.25	0.044	0.556	11.75	0.455
482	8	4	0.25	0.507	3.493	7.75	*
483	8	0.576	0.25	0.062	0.514	7.75	0.295
484	8	4	0.25	0.539	3.461	7.75	0.05
485	12	1.342	0.25	0.057	1.285	11.75	0.365
486	8	4	72	0.921	3.079	-64	*
487	12	1.305	0.25	0.088	1.217	11.75	0.27
488	8	4	0.25	0.977	3.023	7.75	-0.015
489	24	0.763	0.25	0.035	0.728	23.75	0.23
490	4	3.231	72	0.169	3.062	-68	1
491	24	0.692	0.25	0.067	0.625	23.75	*
492	4	3.03	72	0.138	2.892	-68	0.925
493	24	1.616	0.25	0.043	1.573	23.75	0.485
494	4	4	72	0.446	3.554	-68	0.605
495	24	1.485	0.25	0.079	1.406	23.75	0.43
496	4	3.463	72	0.471	2.992	-68	0.535
497	72	0.489	0.25	0.043	0.446	71.75	1.22
498	4	2.397	72	0.114	2.283	-68	1.165
499	72	0.605	0.25	0.063	0.542	71.75	0.875
500	4	2.338	72	0.123	2.215	-68	0.95
501	72	0.484	0.25	0.053	0.431	71.75	0.93
502	4	2.204	72	0.205	1.999	-68	0.935
503	48	0.664	0.25	0.091	0.573	47.75	0.94
504	4	2.164	72	0.177	1.987	-68	0.82
505	72	0.676	0.25	0.054	0.622	71.75	-0.21
506	8	2.84	72	0.165	2.675	-64	0.315
507	72	1.127	0.25	0.086	1.041	71.75	-0.34
508	8	2.888	72	0.174	2.714	-64	1.09
509	72	0.723	0.25	0.065	0.658	71.75	-0.2
510	8	2.694	72	0.203	2.491	-64	0.975
511	72	1.023	0.25	0.101	0.922	71.75	-0.31
512	8	2.728	72	0.194	2.534	-64	1.16
513	24	0.151	72	0.037	0.114	-48	1.44
514	4	0.676	72	0.069	0.607	-68	0.68
515	8	0.153	72	0.022	0.131	-64	0.895
516	2	0.611	72	0.089	0.522	-70	0.655
517	12	0.157	72	0.025	0.132	-60	1.485
518	2	0.726	72	0.097	0.629	-70	0.7
519	4	0.164	72	0.024	0.14	-68	*
520	2	0.703	72	0.102	0.601	-70	0.585
521	12	0.809	72	0.112	0.697	-60	1.295
522	4	1.769	72	0.261	1.508	-68	0.14
523	4	0.738	72	0.104	0.634	-68	1.08
524	2	1.485	72	0.26	1.225	-70	0.395
525	12	1.083	72	0.3	0.783	-60	0.57
526	2	1.629	72	0.347	1.282	-70	0.27
527	4	0.979	72	0.26	0.719	-68	0.405
528	2	1.358	72	0.297	1.061	-70	0.075
529	24	0.35	0.25	0.097	0.253	23.75	0.26
530	8	0.794	72	0.135	0.659	-64	0.665
531	12	0.403	0.25	0.128	0.275	11.75	0.61
532	8	0.723	72	0.143	0.58	-64	0.53
533	72	0.658	0.25	0.097	0.561	71.75	-0.16
534	8	0.812	0.25	0.243	0.569	7.75	0.63
535	72	0.724	0.25	0.134	0.59	71.75	-0.17
536	4	0.764	72	0.254	0.51	-68	0.4
537	72	0.219	0.25	0.026	0.193	71.75	-0.835
538	24	1.354	0.25	0.142	1.212	23.75	0.33
539	72	0.263	0.25	0.069	0.194	71.75	-0.53
540	24	1.412	0.25	0.194	1.218	23.75	0.585
541	72	0.207	0.25	0.029	0.178	71.75	-0.115
542	48	1.303	0.25	0.292	1.011	47.75	-0.025
543	72	0.274	0.25	0.069	0.205	71.75	-0.175
544	48	1.336	0.25	0.346	0.99	47.75	*
545	12	0.067	0.25	0.043	0.024	11.75	0.215
546	4	0.31	72	0.044	0.266	-68	0.68
547	24	0.088	72	0.06	0.028	-48	0.105
548	4	0.331	72	0.048	0.283	-68	0.54
549	8	0.088	0.25	0.045	0.043	7.75	0.24
550	4	0.389	72	0.086	0.303	-68	0.475
551	8	0.104	0.25	0.064	0.04	7.75	0.195
552	4	0.401	72	0.087	0.314	-68	0.37
553	48	0.713	0.25	0.07	0.643	47.75	-0.19
554	72	4	0.25	0.187	3.813	71.75	-0.68
555	48	0.676	0.25	0.125	0.551	47.75	-0.215
556	72	4	0.25	0.239	3.761	71.75	-0.655
557	72	1.418	0.25	0.089	1.329	71.75	-0.465
558	72	4	0.25	0.302	3.698	71.75	-0.64
559	48	1.375	0.25	0.125	1.25	47.75	-0.435
560	72	4	0.25	0.355	3.645	71.75	-0.65
561	72	0.409	0.25	0.037	0.372	71.75	-0.395
562	72	1.579	0.25	0.197	1.382	71.75	-0.365
563	72	0.475	0.25	0.068	0.407	71.75	-0.39
564	72	1.661	0.25	0.208	1.453	71.75	-0.365
565	72	0.521	0.25	0.045	0.476	71.75	-0.415
566	72	1.72	0.25	0.288	1.432	71.75	-0.355
567	72	0.574	0.25	0.108	0.466	71.75	-0.35
568	72	1.735	0.25	0.339	1.396	71.75	-0.36
569	72	0.336	0.25	0.043	0.293	71.75	0.215
570	72	1.346	0.25	0.249	1.097	71.75	0.68
571	72	0.378	0.25	0.087	0.291	71.75	0.105
572	72	1.344	0.25	0.294	1.05	71.75	0.54
573	72	0.333	0.25	0.054	0.279	71.75	0.24
574	72	1.216	0.25	0.412	0.804	71.75	0.475
575	72	0.392	0.25	0.11	0.282	71.75	0.195
576	72	1.269	0.25	0.454	0.815	71.75	0.37
577	72	0.368	0.25	0.045	0.323	71.75	-0.215
578	72	1.292	0.25	0.207	1.085	71.75	-0.2
579	72	0.414	0.25	0.075	0.339	71.75	-0.25
580	72	1.331	0.25	0.257	1.074	71.75	-0.17
581	72	0.363	0.25	0.056	0.307	71.75	-0.15
582	72	1.17	0.25	0.344	0.826	71.75	-0.14
583	72	0.426	0.25	0.099	0.327	71.75	-0.155
584	72	1.231	0.25	0.4	0.831	71.75	-0.125

Appendix VI. MnO_2 Filtration Data
(5.0, 1.0, 0.4, and 0.1 μm)

2 HOUR FILTRATION DATA

			pre-filtration		5 mm			1 mm			0.4 mm			0.1 mm			
Stabilization	**GW**	**pH**	418 nm	525 nm	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	unfilt
none	Base	3	0.702	1.730	0.249	1.331	0.645	0.016	1.141	0.332	0.075	1.121	0.000	0.050	1.104	0.036	0.000
1a	Base	3	3.500	1.830	0.703	0.580	0.799	0.025	0.247	0.194	0.056	0.246	0.000	0.010	0.175	0.013	0.000
1b	Base	3	2.951	1.769	0.091	0.755	0.969	0.041	0.676	0.017	0.229	0.610	0.000	0.028	0.573	0.068	0.000
2a	Base	3	0.028	1.352	0.030	1.348	0.000	0.025	1.330	0.179	0.028	1.318	0.000	0.020	1.301	0.286	0.536
2b	Base	3	0.905	1.662	0.855	1.629	0.055	0.021	1.127	0.922	0.060	1.145	0.000	0.016	1.085	0.049	0.000
3a	Base	3	3.198	0.984	3.500	0.974	0.000	3.500	0.915	0.000	3.500	0.891	0.000	3.198	0.796	0.094	0.906
3b	Base	3	2.773	1.192	3.500	0.974	0.000	3.500	0.915	0.000	3.500	0.871	0.000	3.500	0.796	0.000	1.000
4a	Base	3	2.351	1.555	2.160	1.702	0.081	0.083	1.018	0.883	0.077	0.937	0.003	0.076	0.792	0.000	0.032
4b	Base	3	2.184	1.655	2.242	1.565	0.000	1.194	1.275	0.480	0.673	0.962	0.239	0.453	0.863	0.101	0.181
none	Base	7	0.608	1.699	0.224	1.350	0.632	0.035	1.151	0.311	0.072	1.142	0.000	0.049	1.116	0.038	0.020
1a	Base	7	2.650	1.757	0.023	0.011	0.991	0.026	0.011	0.000	0.012	0.003	0.005	0.010	0.004	0.001	0.003
1b	Base	7	2.518	1.773	0.241	1.147	0.904	0.279	0.994	0.000	0.449	0.960	-0.068	0.390	0.853	0.023	0.140
2a	Base	7	0.591	1.404	0.435	1.366	0.264	0.465	1.356	0.000	0.533	1.009	0.000	0.533	1.052	0.000	0.736
2b	Base	7	1.077	1.569	1.106	1.540	0.000	1.080	1.528	0.024	0.069	1.114	0.939	0.043	1.065	0.024	0.013
3a	Base	7	0.689	0.754	0.740	0.742	0.000	0.618	0.576	0.177	0.430	0.428	0.273	0.506	0.444	0.000	0.550
3b	Base	7	0.447	0.742	0.457	0.735	0.000	0.661	0.645	0.000	0.337	0.489	0.725	0.327	0.426	0.022	0.253
4a	Base	7	0.496	0.702	0.526	0.690	0.000	0.804	0.635	0.000	0.405	0.479	0.804	0.376	0.466	0.058	0.137
4b	Base	7	0.520	0.676	0.516	0.656	0.008	0.472	0.628	0.085	0.375	0.560	0.187	0.413	0.531	0.000	0.721
none	Ca	3	0.654	1.727	0.173	1.262	0.735	0.014	1.121	0.243	0.049	1.119	0.000	0.048	1.081	0.002	0.020
1a	Ca	3	2.805	1.745	0.023	0.344	0.992	0.007	0.313	0.006	0.007	0.291	0.000	0.010	0.248	0.000	0.002
1b	Ca	3															
2a	Ca	3	0.023	1.343	0.025	1.312	0.000	0.025	1.312	0.000	0.025	1.259	0.000	0.020	1.233	0.217	0.783
2b	Ca	3	0.728	1.669	0.675	1.646	0.073	0.039	1.205	0.874	0.022	1.123	0.023	0.016	1.033	0.008	0.022
3a	Ca	3	0.959	0.502	1.046	0.485	0.000	0.563	0.168	0.504	0.681	0.159	0.000	0.646	0.147	0.036	0.460
3b	Ca	3	0.564	0.647	0.597	0.629	0.000	0.483	0.484	0.202	0.466	0.363	0.030	0.510	0.325	0.000	0.768
4a	Ca	3	0.680	0.717	0.679	0.708	0.001	0.401	0.600	0.409	0.110	0.193	0.428	0.176	0.059	0.000	0.162
4b	Ca	3	0.702	0.666	0.742	0.649	0.000	0.742	0.574	0.000	0.322	0.437	0.598	0.311	0.242	0.016	0.386
none	Ca	7	0.574	1.697	0.251	1.360	0.563	0.019	1.135	0.404	0.056	1.136	0.000	0.038	1.102	0.031	0.002
1a	Ca	7	2.035	1.632	0.391	0.956	0.808	0.061	0.789	0.162	0.120	0.777	0.000	0.175	0.751	0.000	0.030
1b	Ca	7	1.904	1.860	1.260	1.628	0.338	0.020	1.006	0.651	0.078	0.973	0.000	0.109	0.946	0.000	0.011
2a	Ca	7	0.373	1.359	0.415	1.318	0.000	0.423	1.316	0.000	0.426	1.263	0.000	0.415	1.318	0.029	0.971
2b	Ca	7	1.053	1.779	0.975	1.727	0.074	0.328	1.295	0.614	0.025	1.046	0.288	0.030	1.074	0.000	0.024
3a	Ca	7	0.604	0.628	0.637	0.619	0.000	0.519	0.479	0.195	0.490	0.419	0.048	0.539	0.395	0.000	0.757
3b	Ca	7	0.400	0.702	0.385	0.670	0.038	0.241	0.570	0.360	0.222	0.532	0.048	0.226	0.506	0.000	0.555
4a	Ca	7	0.411	0.701	0.467	0.693	0.000	0.409	0.646	0.141	0.272	0.583	0.333	0.253	0.551	0.046	0.479
4b	Ca	7	0.381	0.669	0.419	0.653	0.000	0.414	0.625	0.013	0.326	0.571	0.231	0.270	0.524	0.147	0.609
none	PO4	3	0.662	1.618	0.633	1.561	0.044	0.085	1.178	0.828	0.045	1.110	0.060	0.032	1.053	0.020	0.048
1a	PO4	3	3.500	1.020	3.500	0.996	0.000	3.500	0.913	0.000	3.500	0.880	0.000	1.298	0.327	0.629	0.371
1b	PO4	3	2.276	1.506	2.330	1.387	0.000	0.238	0.493	0.919	0.053	0.354	0.081	0.088	0.288	0.000	0.000
2a	PO4	3	0.027	1.361	0.024	1.347	0.111	0.023	1.324	0.037	0.019	1.268	0.148	0.018	1.181	0.037	0.667
2b	PO4	3	0.653	1.586	0.560	1.324	0.142	0.022	1.000	0.824	0.008	0.444	0.021	0.008	0.370	0.000	0.012
3a	PO4	3	0.741	0.464	0.774	0.366	0.000	0.813	0.366	0.000	0.843	0.348	0.000	0.903	0.311	0.000	1.000
3b	PO4	3	0.493	0.575	0.468	0.336	0.051	0.490	0.335	0.000	0.552	0.318	0.000	0.625	0.262	0.000	0.949
4a	PO4	3	0.314	0.656	0.313	0.643	0.003	0.148	0.315	0.525	0.088	0.313	0.191	0.086	0.073	0.006	0.274
4b	PO4	3	0.362	0.626	0.341	0.383	0.058	0.262	0.361	0.218	0.134	0.164	0.354	0.168	0.170	0.000	0.370
none	PO4	7	0.268	1.629	0.269	1.546	0.000	0.034	1.378	0.877	0.027	1.344	0.026	0.023	1.293	0.015	0.082
1a	PO4	7	1.044	1.530	0.979	1.503	0.062	0.070	1.149	0.871	0.130	1.088	0.000	0.809	0.896	0.000	0.067
1b	PO4	7	0.314	1.497	0.373	1.458	0.000	0.377	1.442	0.000	0.419	1.421	0.000	0.373	1.320	0.146	0.854
2a	PO4	7	0.297	1.453	0.335	1.441	0.000	0.345	1.428	0.000	0.419	1.352	0.000	0.488	1.300	0.000	1.000
2b	PO4	7	0.140	1.472	0.145	1.448	0.000	0.149	1.420	0.000	0.170	1.319	0.000	0.067	1.144	0.736	0.264
3a	PO4	7	0.236	0.542	0.256	0.502	0.000	0.240	0.459	0.068	0.244	0.443	0.000	0.237	0.399	0.030	0.903
3b	PO4	7	0.110	0.630	0.127	0.599	0.000	0.092	0.580	0.318	0.103	0.538	0.000	0.100	0.488	0.027	0.655
4a	PO4	7	0.119	0.657	0.124	0.646	0.000	0.084	0.607	0.336	0.046	0.582	0.319	0.050	0.520	0.000	0.345
4b	PO4	7	0.126	0.633	0.133	0.607	0.000	0.095	0.596	0.302	0.064	0.559	0.246	0.021	0.504	0.341	0.111

4 HOUR FILTRATION DATA

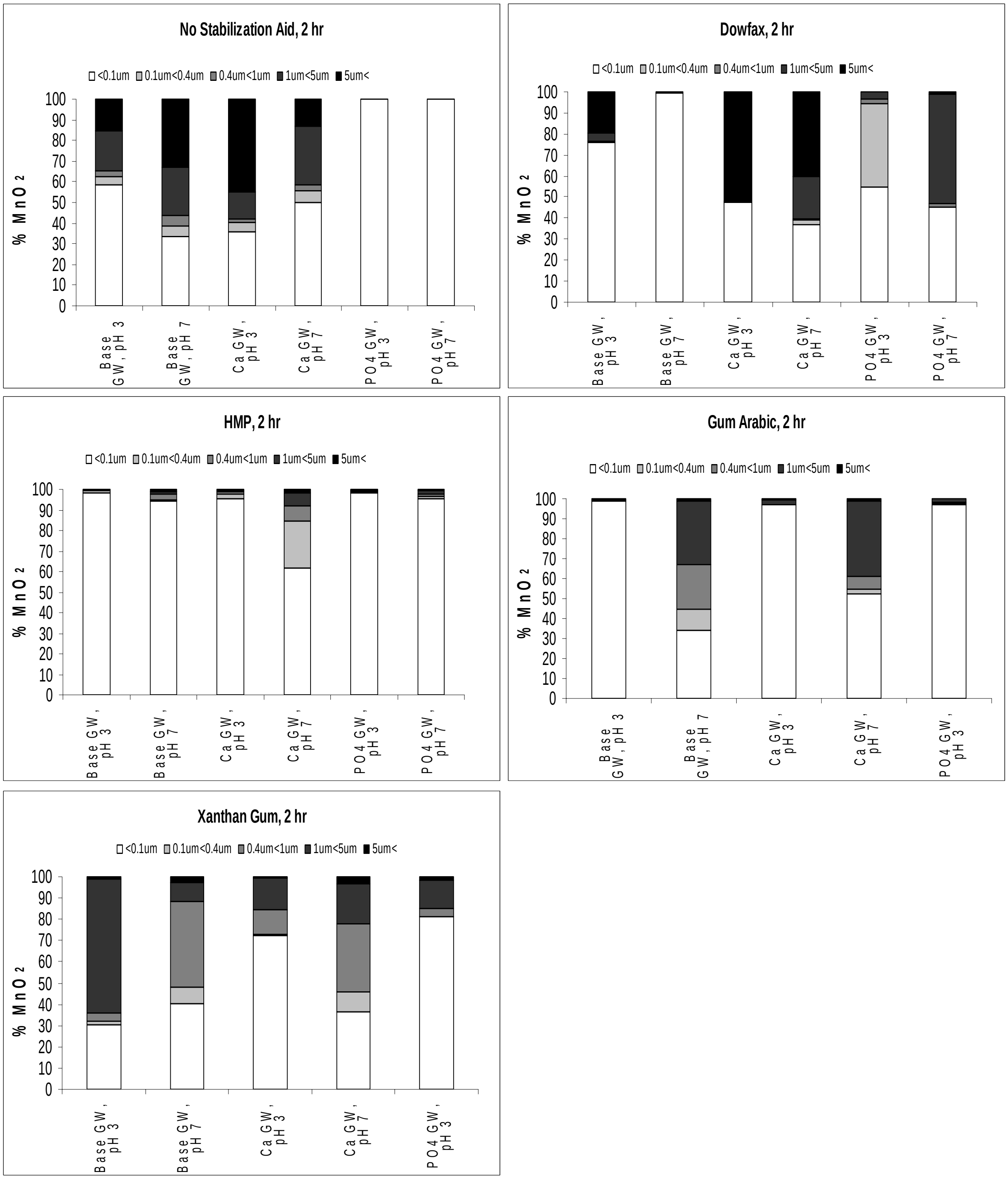
			pre-filtration		5 um			1 um			0.4 um			0.1 um			
Stabilization	**GW**	**pH**	418 nm	525 nm	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	unfilt
none	Base	3	0.676	1.640	0.133	1.141	0.803	0.024	1.038	0.161	0.042	1.004	0.000	0.024	0.965	0.027	0.009
1a	Base	3	3.500	1.721	0.080	0.049	0.977	0.004	0.008	0.022	0.004	0.005	0.000	0.009	0.008	0.000	0.001
1b	Base	3	3.450	1.709	0.061	0.274	0.982	0.006	0.228	0.016	0.009	0.048	0.000	0.048	0.156	0.000	0.002
2a	Base	3	0.023	1.249	0.022	1.221	0.043	0.021	1.141	0.043	0.020	1.101	0.043	0.019	1.071	0.043	0.826
2b	Base	3	0.950	1.656	0.768	1.485	0.192	0.013	0.935	0.795	0.019	0.891	0.000	0.011	0.846	0.008	0.005
3a	Base	3	3.500	0.805	3.500	0.784	0.000	3.500	0.760	0.000	3.428	0.746	0.021	3.185	0.718	0.069	0.910
3b	Base	3	3.500	1.027	3.500	0.784	0.000	3.500	0.760	0.000	3.428	0.746	0.021	3.185	0.718	0.069	0.910
4a	Base	3	2.440	1.755	2.358	1.723	0.034	0.147	0.956	0.906	0.027	0.867	0.049	0.108	0.829	0.000	0.011
4b	Base	3	2.716	1.591	2.627	1.538	0.033	1.150	1.211	0.544	0.258	0.751	0.328	0.192	0.755	0.024	0.071
none	Base	7	0.579	1.602	0.200	1.218	0.655	0.048	1.040	0.263	0.029	1.021	0.033	0.045	0.987	0.000	0.050
1a	Base	7	3.376	1.787	3.500	1.747	0.000	0.126	0.505	0.999	0.129	0.480	0.000	0.425	0.423	0.000	0.001
1b	Base	7	2.756	1.723	1.422	1.189	0.484	0.283	0.689	0.413	0.523	0.613	0.000	0.702	0.527	0.000	0.103
2a	Base	7	0.555	1.361	0.583	1.273	0.000	0.588	1.227	0.000	0.628	1.159	0.000	0.588	1.159	0.072	0.928
2b	Base	7	1.138	1.595	1.020	1.526	0.104	0.070	1.118	0.835	0.020	1.045	0.044	0.030	0.959	0.000	0.018
3a	Base	7	1.001	0.743	0.987	0.714	0.014	0.815	0.538	0.172	0.626	0.375	0.189	0.626	0.375	0.000	0.625
3b	Base	7	0.674	0.760	0.679	0.746	0.000	0.546	0.628	0.197	0.294	0.432	0.374	0.311	0.389	0.000	0.429
4a	Base	7	0.730	0.703	0.747	0.677	0.000	0.739	0.632	0.011	0.539	0.525	0.274	0.443	0.431	0.132	0.584
4b	Base	7	0.779	0.671	0.764	0.647	0.019	0.752	0.586	0.015	0.478	0.445	0.352	0.511	0.426	0.000	0.614
none	Ca	3	0.622	1.646	0.126	1.158	0.797	0.014	0.061	0.180	0.025	1.043	0.000	0.026	0.992	0.000	0.023
1a	Ca	3	2.512	1.521	0.018	0.025	0.993	0.005	0.014	0.005	0.006	0.010	0.000	0.005	0.006	0.000	0.002
1b	Ca	3	1.716	1.865	0.128	0.612	0.925	0.053	0.498	0.044	0.118	0.455	0.000	0.247	0.440	0.000	0.031
2a	Ca	3	0.061	1.240	0.060	1.204	0.016	0.060	1.174	0.000	0.057	1.148	0.049	0.054	1.103	0.049	0.885
2b	Ca	3	0.675	1.602	0.568	1.470	0.159	0.012	0.998	0.824	0.012	0.952	0.000	0.012	0.012	0.000	0.018
3a	Ca	3	1.402	0.434	1.343	0.415	0.042	1.153	0.303	0.136	1.073	0.263	0.057	0.990	0.237	0.059	0.706
3b	Ca	3	0.849	0.620	0.831	0.581	0.021	0.606	0.373	0.265	0.536	0.297	0.082	0.501	0.210	0.041	0.590
4a	Ca	3	0.889	0.723	0.878	0.673	0.012	0.049	0.247	0.933	0.052	0.216	0.000	0.052	0.216	0.000	0.055
4b	Ca	3	0.978	0.662	0.919	0.623	0.060	0.813	0.498	0.108	0.278	0.376	0.547	0.272	0.196	0.006	0.278
none	Ca	7	0.551	1.594	0.199	1.276	0.639	0.018	1.055	0.328	0.021	1.051	0.000	0.036	0.996	0.000	0.033
1a	Ca	7	0.663	0.931	0.071	0.570	0.893	0.051	0.527	0.030	0.097	0.506	0.000	0.132	0.486	0.000	0.077
1b	Ca	7	1.719	1.725	1.000	1.333	0.418	0.019	0.781	0.571	0.032	0.738	0.000	0.131	0.708	0.000	0.011
2a	Ca	7	0.541	1.319	0.519	1.268	0.041	0.513	1.236	0.011	0.495	1.185	0.033	0.452	1.140	0.079	0.835
2b	Ca	7	1.057	1.756	0.975	1.727	0.078	0.246	1.186	0.690	0.025	1.002	0.209	0.032	0.967	0.000	0.024
3a	Ca	7	0.994	0.565	0.987	0.541	0.007	0.819	0.359	0.169	0.778	0.311	0.041	0.788	0.293	0.000	0.783
3b	Ca	7	0.618	0.679	0.599	0.655	0.031	0.433	0.515	0.269	0.388	0.472	0.073	0.386	0.435	0.003	0.625
4a	Ca	7	0.600	0.697	0.654	0.670	0.000	0.527	0.609	0.212	0.245	0.520	0.470	0.208	0.485	0.062	0.257
4b	Ca	7	0.649	0.654	0.770	0.617	0.000	0.660	0.560	0.169	0.325	0.449	0.516			0.501	0.000
none	PO4	3	0.618	0.028	0.570	1.517	0.078	0.028	1.086	0.877	0.027	1.019	0.002	0.063	0.868	0.000	0.044
1a	PO4	3	3.500	0.897	3.500	0.829	0.000	1.378	0.360	0.606	0.017	0.003	0.389	0.008	0.001	0.003	0.002
1b	PO4	3	3.500	1.485	3.500	1.442	0.000	0.341	0.216	0.903	0.039	0.079	0.086	0.042	0.040	0.000	0.011
2a	PO4	3	0.025	1.297	0.022	1.220	0.120	0.031	1.170	0.000	0.025	1.139	0.240	0.025	1.115	0.000	0.640
2b	PO4	3	0.660	1.569	0.539	1.424	0.183	0.021	1.022	0.785	0.020	0.940	0.002	0.019	0.888	0.002	0.029
3a	PO4	3	1.268	0.353	1.246	0.335	0.017	1.165	0.300	0.064	1.121	0.279	0.035	1.093	0.265	0.022	0.862
3b	PO4	3	0.951	0.503	0.944	0.465	0.007	0.807	0.359	0.144	0.832	0.349	0.000	0.826	0.328	0.006	0.842
4a	PO4	3	0.442	0.645	0.411	0.537	0.070	0.217	0.431	0.439	0.118	0.355	0.224	0.115	0.311	0.007	0.260
4b	PO4	3	0.535	0.606	0.512	0.528	0.043	0.275	0.411	0.443	0.162	0.282	0.211	0.150	0.252	0.022	0.280
none	PO4	7	0.338	1.598	0.306	1.537	0.095	0.030	1.340	0.817	0.038	1.247	0.000	0.020	1.228	0.053	0.036
1a	PO4	7	1.302	1.475	0.976	1.362	0.250	0.175	0.897	0.615	0.216	0.868	0.000	0.264	0.827	0.000	0.134
1b	PO4	7	0.913	1.590	0.919	1.521	0.000	0.439	1.346	0.526	0.079	1.106	0.394	0.110	1.019	0.000	0.080
2a	PO4	7	0.535	1.444	0.595	1.322	0.000	0.653	1.281	0.000	0.679	1.260	0.000	1.123	1.096	0.000	1.000
2b	PO4	7	0.195	1.442	0.214	1.293	0.000	0.213	1.244	0.005	0.128	1.160	0.436	0.058	1.093	0.359	0.200
3a	PO4	7	0.409	0.467	0.411	0.439	0.000	0.379	0.409	0.078	0.389	0.368	0.000	0.402	0.353	0.000	0.922
3b	PO4	7	0.197	0.595	0.209	0.517	0.000	0.163	0.517	0.234	0.156	0.493	0.036	0.169	0.466	0.000	0.731
4a	PO4	7	0.220	0.647	0.225	0.607	0.000	0.165	0.576	0.273	0.102	0.532	0.286	0.110	0.524	0.000	0.441
4b	PO4	7	0.230	0.611	0.234	0.582	0.000	0.170	0.552	0.278	0.136	0.523	0.148	0.132	0.505	0.017	0.557

8 HOUR FILTRATION DATA

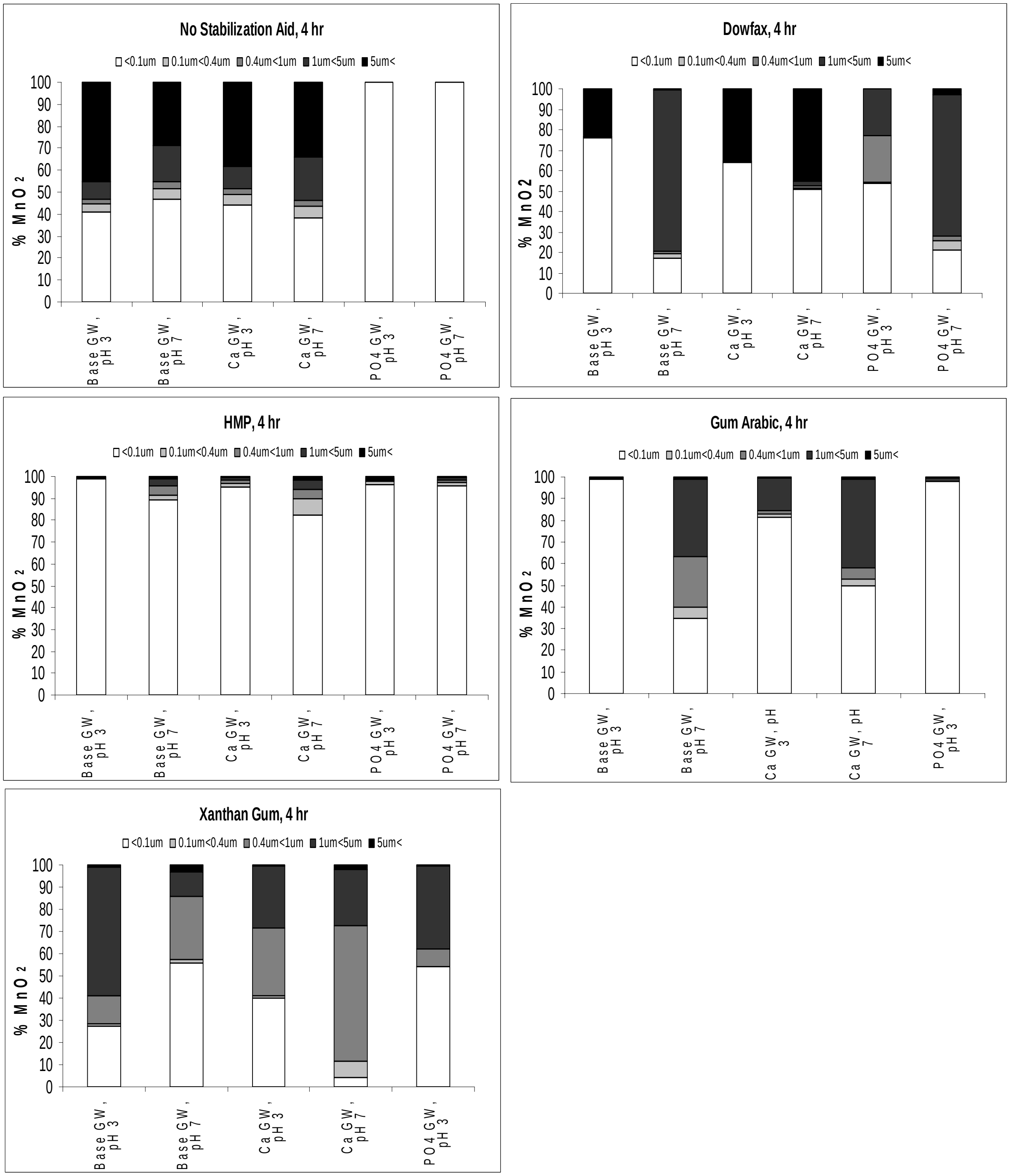
			pre-filtration		5 mm			1 mm			0.4 mm			0.1 mm			
Stabilization	**GW**	**pH**	418 nm	525 nm	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	unfilt
none	Base	3	0.502	1.454	0.119	1.091	0.763	0.032	1.012	0.173	0.045	0.939	0.000	0.051	0.912	0.000	0.064
1a	Base	3	2.980	1.828	0.032	0.004	0.989	0.015	0.006	0.006	0.010	0.003	0.002	0.013	0.006	0.000	0.003
1b	Base	3	1.190	0.571	0.048	0.020	0.960	0.006	0.003	0.035	0.005	0.001	0.000	0.003	0.000	0.002	0.003
2a	Base	3	0.042	1.147	0.042	1.099	0.000	0.040	1.089	0.048	0.040	1.049	0.000	0.034	1.018	0.143	0.810
2b	Base	3	0.875	1.577	0.613	1.318	0.299	0.008	0.640	0.691	0.011	0.608	0.000	0.011	0.600	0.000	0.009
3a	Base	3	3.218	0.734	3.072	0.715	0.045	2.987	0.691	0.026	2.933	0.683	0.017	2.762	0.653	0.053	0.858
3b	Base	3	3.500	0.891	3.072	0.715	0.122	2.987	0.691	0.024	2.933	0.683	0.015	2.762	0.653	0.049	0.789
4a	Base	3	2.672	1.779	2.689	1.726	0.000	0.109	0.806	0.966	0.022	0.739	0.033	0.045	0.715	0.000	0.002
4b	Base	3	3.259	1.609	3.035	1.534	0.069	2.046	1.079	0.303	1.084	0.851	0.295	0.919	0.751	0.051	0.282
none	Base	7	0.475	1.458	0.072	1.071	0.848	0.024	1.002	0.101	0.043	0.964	0.000	0.043	0.933	0.000	0.051
1a	Base	7	3.500	1.805	3.474	1.650	0.007	0.042	0.274	0.981	0.113	0.264	0.000	0.120	0.258	0.000	0.012
1b	Base	7	1.095	1.094	0.778	0.322	0.289	1.120	0.306	0.000	1.291	0.316	0.000	1.204	0.288	0.079	0.631
2a	Base	7	0.658	1.324	0.656	1.272	0.003	0.662	1.257	0.000	0.651	1.204	0.017	0.673	1.185	0.000	0.980
2b	Base	7	0.951	1.549	0.621	1.347	0.347	0.025	1.024	0.627	0.025	0.997	0.000	0.022	0.954	0.003	0.023
3a	Base	7	1.342	0.715	1.305	0.675	0.028	0.442	0.159	0.643	0.185	0.057	0.192	0.065	0.021	0.089	0.048
3b	Base	7	0.942	0.765	0.937	0.732	0.005	0.624	0.498	0.332	0.471	0.364	0.162	0.571	0.304	0.000	0.500
4a	Base	7	0.930	0.709	1.149	0.638	0.000	0.988	0.582	0.173	0.488	0.381	0.538	0.442	0.347	0.049	0.240
4b	Base	7	0.987	0.671	0.973	0.637	0.014	0.927	0.600	0.047	0.707	0.506	0.223	0.648	0.475	0.060	0.657
none	Ca	3	0.473	1.500	0.100	1.133	0.789	0.021	1.024	0.167	0.059	1.013	0.000	0.038	0.961	0.044	0.000
1a	Ca	3	0.771	0.874	0.021	0.009	0.973	0.005	0.001	0.021	0.006	0.005	0.000	0.004	0.001	0.003	0.004
1b	Ca	3	0.722	0.871	0.021	0.009	0.971	0.005	0.001	0.022	0.006	0.005	0.000	0.004	0.001	0.003	0.004
2a	Ca	3	0.157	1.181	0.156	1.149	0.006	0.154	1.131	0.013	0.149	1.101	0.032	0.136	1.061	0.083	0.866
2b	Ca	3	0.555	1.463	0.304	1.197	0.452	0.074	0.924	0.414	0.013	0.900	0.110	0.010	0.857	0.005	0.018
3a	Ca	3	1.256	0.366	1.113	0.323	0.114	0.970	0.250	0.114	0.856	0.207	0.091	0.824	0.199	0.025	0.656
3b	Ca	3	1.143	0.559	0.929	0.429	0.187	0.292	0.075	0.557	0.296	0.068	0.000	0.197	0.040	0.087	0.169
4a	Ca	3	1.089	0.738	1.007	0.697	0.075	0.312	0.437	0.638	0.121	0.294	0.175	0.117	0.285	0.004	0.107
4b	Ca	3	1.275	0.669	1.258	0.602	0.013	0.848	0.465	0.322	0.270	0.274	0.453	0.266	0.251	0.003	0.209
none	Ca	7	0.426	1.439	0.088	1.110	0.793	0.023	1.016	0.153	0.032	0.993	0.000	0.031	0.942	0.002	0.052
1a	Ca	7	0.613	0.665	0.045	0.281	0.927	0.014	0.246	0.051	0.023	0.235	0.000	0.080	0.226	0.000	0.023
1b	Ca	7	1.451	1.431	1.366	1.329	0.059	0.034	0.587	0.918	0.065	0.567	0.000	0.076	0.556	-0.008	0.031
2a	Ca	7	0.609	1.293	0.608	1.276	0.002	0.591	1.238	0.028	0.587	1.212	0.007	0.497	1.144	0.148	0.816
2b	Ca	7	1.122	1.769	0.902	1.642	0.196	0.472	1.252	0.383	0.030	1.008	0.394	0.024	0.960	0.005	0.021
3a	Ca	7	1.346	0.487	1.235	0.449	0.082	1.003	0.261	0.172	0.894	0.223	0.081	0.848	0.210	0.034	0.630
3b	Ca	7	0.986	0.628	0.964	0.602	0.022	0.749	0.418	0.218	0.696	0.371	0.054	0.652	0.341	0.045	0.661
4a	Ca	7	0.850	0.689	0.879	0.657	0.000	0.757	0.567	0.144	0.358	0.462	0.469	0.335	0.429	0.027	0.360
4b	Ca	7	0.882	0.647	1.225	0.581	0.000	0.871	0.537	0.401	0.407	0.383	0.526	0.377	0.365	0.034	0.039
none	PO4	3	0.548	1.510	0.442	1.379	0.193	0.018	1.023	0.774	0.022	0.990	0.000	0.068	0.765	0.000	0.033
1a	PO4	3	2.406	0.715	1.296	0.487	0.461	0.010	0.001	0.534	0.009	0.003	0.000	0.012	0.004	0.000	0.004
1b	PO4	3	2.748	1.156	2.509	1.079	0.087	0.030	0.009	0.902	0.007	0.002	0.008	0.005	0.003	0.001	0.002
2a	PO4	3	0.046	1.224	0.043	1.195	0.065	0.040	1.177	0.065	0.023	1.123	0.370	0.018	1.181	0.109	0.391
2b	PO4	3	0.611	1.550	0.407	1.349	0.334	0.015	1.019	0.642	0.017	0.947	0.000	0.012	0.894	0.008	0.016
3a	PO4	3	1.118	0.273	1.070	0.262	0.043	1.008	0.240	0.055	0.963	0.232	0.040	0.804	0.185	0.142	0.719
3b	PO4	3	1.374	0.404	1.285	0.372	0.065	1.112	0.283	0.126	1.059	0.255	0.039	0.905	0.216	0.112	0.659
4a	PO4	3	0.537	0.638	0.507	0.604	0.056	0.265	0.421	0.451	0.146	0.373	0.222	0.121	0.187	0.047	0.225
4b	PO4	3	0.677	0.608	0.636	0.536	0.061	0.412	0.392	0.331	0.268	0.346	0.213	0.261	0.325	0.010	0.386
none	PO4	7	0.379	1.553	0.324	1.474	0.145	0.030	1.255	0.776	0.028	1.230	0.005	0.038	1.126	0.000	0.074
1a	PO4	7	1.375	1.445	0.869	1.153	0.368	0.117	0.733	0.547	0.212	0.691	0.000	0.330	0.640	0.000	0.085
1b	PO4	7	1.068	1.572	0.859	1.445	0.196	0.056	1.147	0.752	0.071	1.006	0.000	0.062	1.012	0.008	0.044
2a	PO4	7	0.778	1.386	0.758	1.342	0.026	0.758	1.324	0.000	0.751	1.281	0.009	0.753	1.263	0.000	0.965
2b	PO4	7	0.253	1.371	0.247	1.320	0.024	0.252	1.229	0.000	0.029	1.124	0.881	0.029	1.090	0.000	0.095
3a	PO4	7	0.613	0.403	0.595	0.380	0.029	0.576	0.356	0.031	0.554	0.337	0.036	0.586	0.311	0.000	0.904
3b	PO4	7	0.290	0.572	0.289	0.552	0.003	0.238	0.528	0.176	0.247	0.481	0.000	0.251	0.444	0.000	0.821
4a	PO4	7	0.313	0.635	0.311	0.611	0.006	0.225	0.553	0.275	0.108	0.495	0.374	0.100	0.458	0.026	0.319
4b	PO4	7	0.312	0.602	0.306	0.581	0.019	0.259	0.488	0.151	0.202	0.469	0.183	0.188	0.434	0.045	0.603

24 HOUR FILTRATION DATA

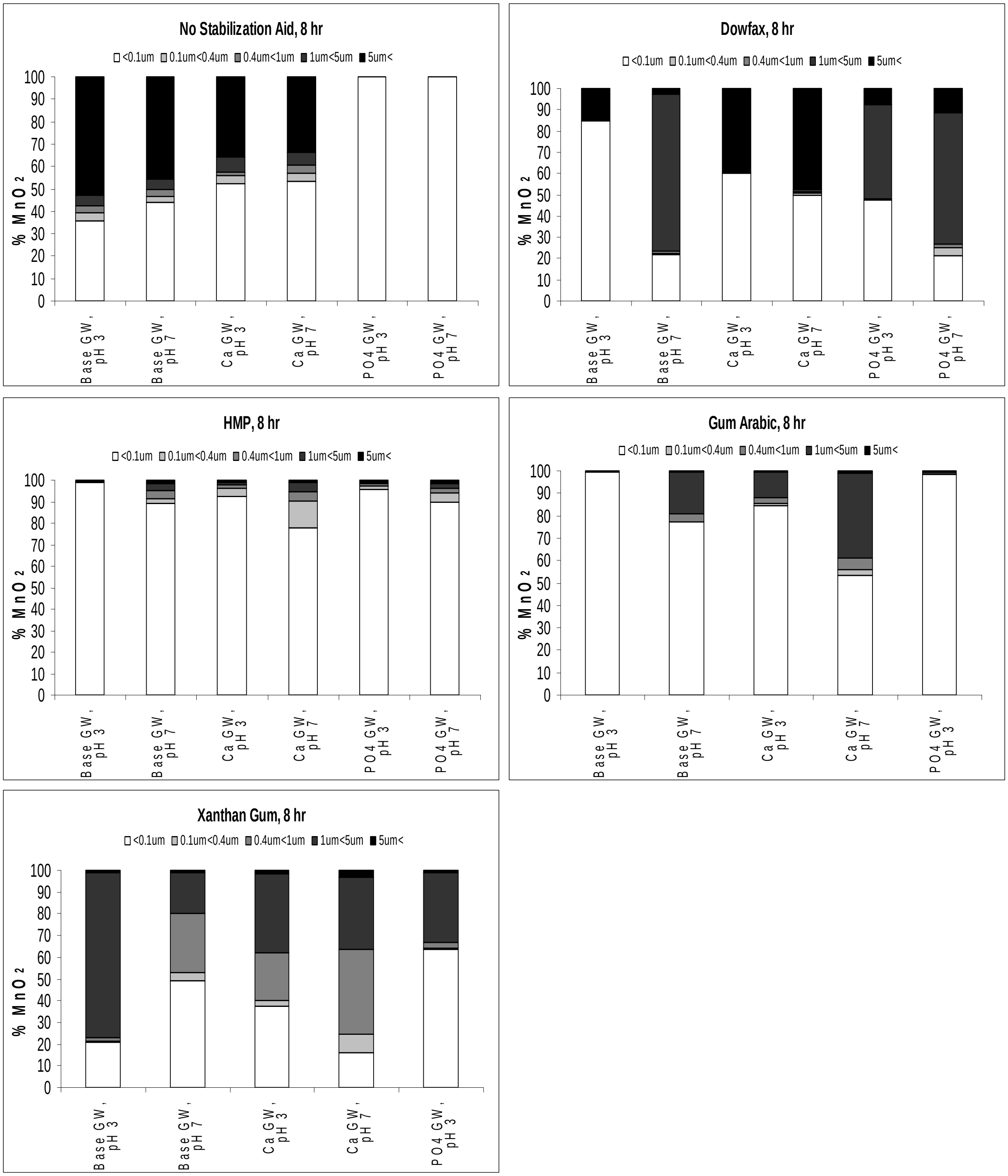
			pre-filtration		5 mm			1 mm			0.4 mm			0.1 mm			
Stabilization	**GW**	**pH**	418 nm	525 nm	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	418 nm	525 nm	fraction	unfilt
none	Base	3	0.123	1.144	0.059	1.001	0.520	0.047	0.974	0.098	0.061	0.982	0.000	0.081	0.938	0.000	0.382
1a	Base	3	0.759	0.343	0.071	0.018	0.906	0.010	0.001	0.080	0.005	0.000	0.007	0.007	0.002	0.000	0.007
1b	Base	3	0.706	0.329	0.086	0.031	0.878	0.002	0.000	0.119	0.002	0.001	0.000	0.003	0.000	0.000	0.003
2a	Base	3	0.070	1.112	0.061	1.068	0.129	0.061	1.044	0.000	0.057	1.002	0.057	0.022	0.897	0.500	0.314
2b	Base	3	0.819	1.513	0.532	1.325	0.350	0.013	0.836	0.634	0.013	0.782	0.000	0.009	0.773	0.005	0.011
3a	Base	3	2.604	0.626	2.539	0.609	0.025	2.376	0.573	0.063	2.344	0.566	0.012	2.273	0.552	0.027	0.873
3b	Base	3	3.192	0.743	2.539	0.609	0.205	2.376	0.573	0.051	2.344	0.566	0.010	2.273	0.552	0.022	0.712
4a	Base	3	2.619	1.762	1.577	1.423	0.398	0.032	0.717	0.590	0.031	0.689	0.000	0.039	0.665	0.000	0.012
4b	Base	3	3.500	1.618	3.458	1.502	0.012	1.376	0.937	0.595	0.064	0.381	0.375	0.119	0.366	0.000	0.018
none	Base	7	0.148	1.144	0.041	1.015	0.723	0.028	0.966	0.088	0.043	0.977	0.000	0.059	0.930	0.000	0.189
1a	Base	7	1.538	0.905	0.267	0.180	0.826	0.011	0.019	0.166	0.006	0.011	0.003	0.007	0.004	0.000	0.004
1b	Base	7	0.795	0.615	0.126	0.228	0.842	0.117	0.147	0.011	0.197	0.113	0.000	0.210	0.107	0.000	0.147
2a	Base	7	0.729	1.310	0.717	1.277	0.016	0.737	1.260	0.000	0.723	1.222	0.019	0.738	1.202	0.000	0.964
2b	Base	7	0.367	1.164	0.365	1.199	0.000	0.020	1.020	0.940	0.017	0.989	0.008	0.021	0.929	0.000	0.052
3a	Base	7	1.270	0.627	1.258	0.613	0.009	0.943	0.399	0.248	0.578	0.166	0.287	0.495	0.148	0.065	0.390
3b	Base	7	1.350	0.734	1.050	0.461	0.222	0.796	0.301	0.188	0.540	0.199	0.190	0.371	0.139	0.125	0.275
4a	Base	7	1.095	0.716	1.104	0.709	0.000	0.991	0.643	0.103	0.630	0.531	0.330	0.533	0.480	0.089	0.479
4b	Base	7	1.221	0.666	1.209	0.653	0.010	1.158	0.595	0.042	0.805	0.462	0.289	0.787	0.460	0.015	0.645
none	Ca	3	0.137	1.144	0.071	1.032	0.482	0.036	0.915	0.255	0.069	0.981	0.000	0.049	0.934	0.146	0.117
1a	Ca	3	0.163	0.078	0.039	0.018	0.761	0.008	0.002	0.190	0.008	0.003	0.000	0.007	0.002	0.006	0.043
1b	Ca	3	0.146	0.181	0.039	0.018	0.733	0.008	0.002	0.212	0.008	0.003	0.000	0.007	0.002	0.007	0.048
2a	Ca	3	0.670	1.416	0.635	1.370	0.052	0.531	1.302	0.155	0.052	1.033	0.715	0.013	0.987	0.058	0.019
2b	Ca	3	0.151	1.008	0.151	1.037	0.000	0.151	0.909	0.000	0.013	0.012	0.914	0.012	0.838	0.007	0.079
3a	Ca	3	1.033	0.302	1.006	0.295	0.026	0.821	0.208	0.179	0.783	0.190	0.037	0.718	0.175	0.063	0.695
3b	Ca	3	0.899	0.428	0.814	0.380	0.095	0.591	0.195	0.248	0.469	0.122	0.136	0.405	0.101	0.071	0.451
4a	Ca	3	1.319	0.746	1.221	0.700	0.074	0.252	0.302	0.735	0.071	0.183	0.137	0.117	0.194	0.000	0.054
4b	Ca	3	1.693	0.672	1.571	0.629	0.072	0.750	0.316	0.485	0.024	0.092	0.429	0.019	0.074	0.003	0.011
none	Ca	7	0.128	1.117	0.052	1.023	0.594	0.027	0.963	0.195	0.033	0.978	0.000	0.033	0.935	0.000	0.211
1a	Ca	7	0.288	0.200	0.029	0.020	0.899	0.004	0.001	0.087	0.004	0.001	0.000	0.005	0.002	0.000	0.014
1b	Ca	7	0.682	0.875	0.275	0.466	0.597	0.100	0.343	0.257	0.124	0.328	0.000	0.135	0.319	0.000	0.147
2a	Ca	7	0.683	1.288	0.672	1.242	0.016	0.662	1.188	0.015	0.657	1.153	0.007	0.482	1.097	0.256	0.706
2b	Ca	7	1.023	1.715	0.754	1.494	0.263	0.381	1.225	0.365	0.029	0.958	0.344	0.031	0.938	0.000	0.028
3a	Ca	7	1.130	0.407	1.070	0.392	0.053	0.867	0.243	0.180	0.773	0.203	0.083	0.706	0.186	0.059	0.625
3b	Ca	7	1.430	0.407	1.415	0.489	0.010	1.135	0.304	0.196	0.987	0.237	0.103	0.870	0.209	0.082	0.608
4a	Ca	7	1.040	0.713	1.019	0.690	0.020	0.813	0.604	0.198	0.262	0.441	0.530	0.172	0.405	0.087	0.165
4b	Ca	7	1.100	0.634	1.084	0.617	0.015	0.878	0.548	0.187	0.634	0.440	0.222			0.576	0.000
none	PO4	3	0.328	1.149	0.328	1.283	0.000	0.020	1.003	0.939	0.017	0.984	0.009	0.050	0.841	0.000	0.052
1a	PO4	3	0.170	0.048	0.035	0.016	0.794	0.014	0.003	0.124	0.016	0.005	0.000	0.014	0.004	0.012	0.071
1b	PO4	3	0.910	0.152	0.856	0.428	0.059	0.026	0.008	0.912	0.005	0.002	0.023	0.005	0.003	0.000	0.005
2a	PO4	3	0.068	1.177	0.068	1.162	0.000	0.067	1.144	0.015	0.061	1.112	0.088	0.060	1.103	0.015	0.882
2b	PO4	3	0.120	1.109	0.109	1.242	0.092	0.027	0.995	0.683	0.012	0.962	0.125	0.018	0.941	0.000	0.100
3a	PO4	3	0.800	0.197	0.761	0.191	0.049	0.712	0.173	0.061	0.663	0.161	0.061	0.630	0.151	0.041	0.788
3b	PO4	3	0.980	0.280	0.914	0.259	0.067	0.785	0.193	0.132	0.732	0.179	0.054	0.489	0.116	0.248	0.499
4a	PO4	3	0.560	0.631	0.506	0.594	0.096	0.169	0.352	0.602	0.024	0.296	0.259	0.026	0.262	0.000	0.043
4b	PO4	3	0.780	0.598	0.695	0.556	0.109	0.259	0.346	0.559	0.028	0.262	0.296	0.052	0.134	0.000	0.036
none	PO4	7	0.262	1.350	0.262	1.404	0.000	0.025	1.234	0.905	0.027	1.210	0.000	0.032	1.151	0.000	0.095
1a	PO4	7	0.612	0.757	0.596	0.842	0.000	0.118	0.497	0.781	0.164	0.454	0.000	0.238	0.423	0.000	0.219
1b	PO4	7	0.250	1.232	0.267	1.190	0.000	0.057	1.012	0.840	0.071	0.962	0.000	0.082	0.904	0.000	0.160
2a	PO4	7	0.880	1.373	0.895	1.323	0.000	0.893	1.295	0.002	0.917	1.238	0.000	1.015	1.195	0.000	0.998
2b	PO4	7	0.279	1.325	0.279	1.277	0.000	0.097	1.164	0.652	0.026	1.094	0.254	0.028	1.054	0.000	0.093
3a	PO4	7	1.100	0.274	1.051	0.258	0.045	1.002	0.237	0.045	0.977	0.219	0.023	0.690	0.174	0.261	0.627
3b	PO4	7	1.100	0.274	0.492	0.453	0.553	0.445	0.448	0.043	0.428	0.429	0.015	0.410	0.408	0.016	0.373
4a	PO4	7	0.410	0.632	0.394	0.613	0.039	0.305	0.565	0.217	0.215	0.521	0.220	0.204	0.496	0.027	0.498
4b	PO4	7	0.430	0.586	0.418	0.571	0.028	0.336	0.529	0.191	0.284	0.492	0.121	0.259	0.466	0.058	0.602



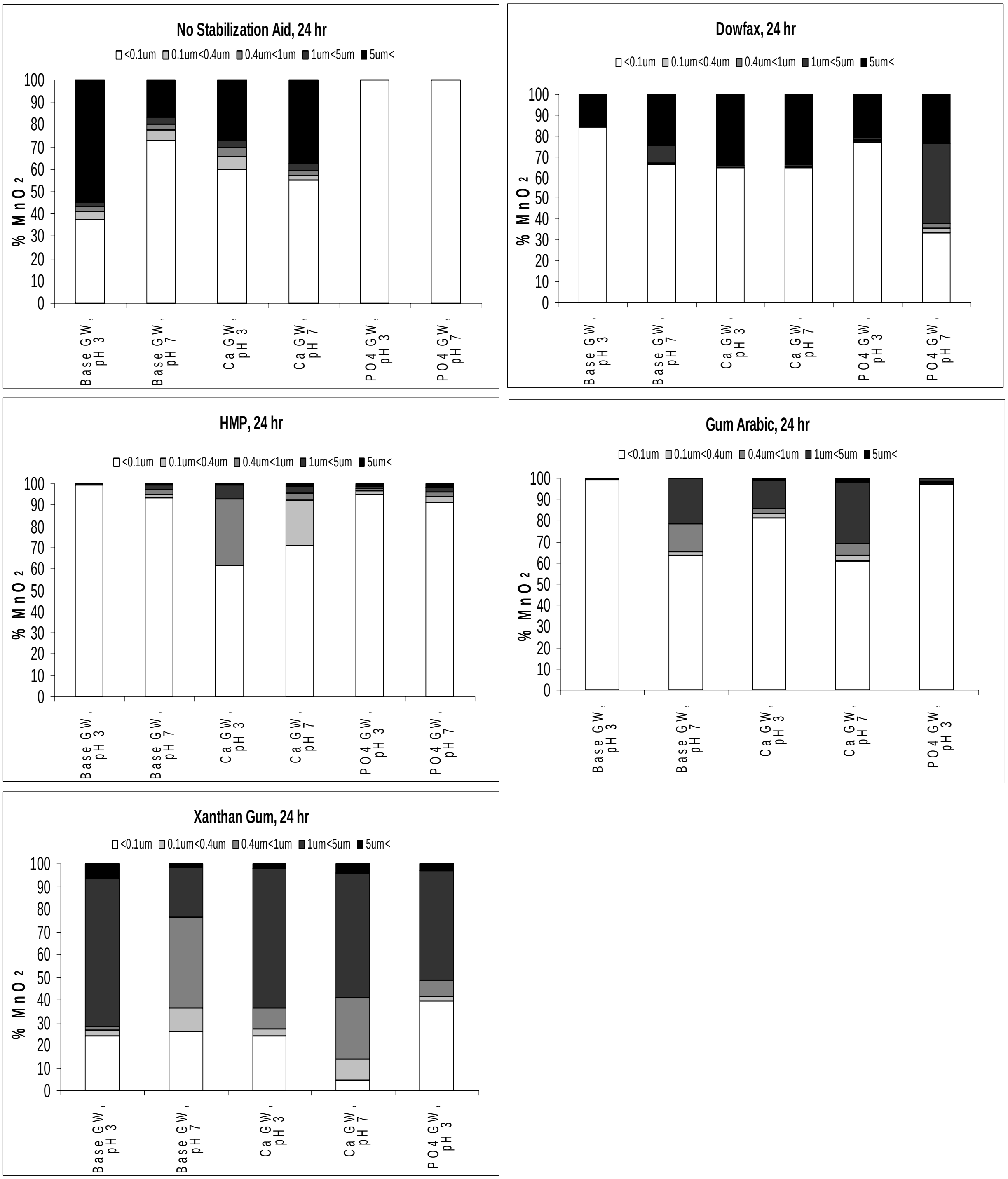
Particle size distribution of a high concentration stabilization aids under various reaction conditions at 2, 4, 8, 24 hour reaction time (particle size unit = µm) (page 1 of 4).



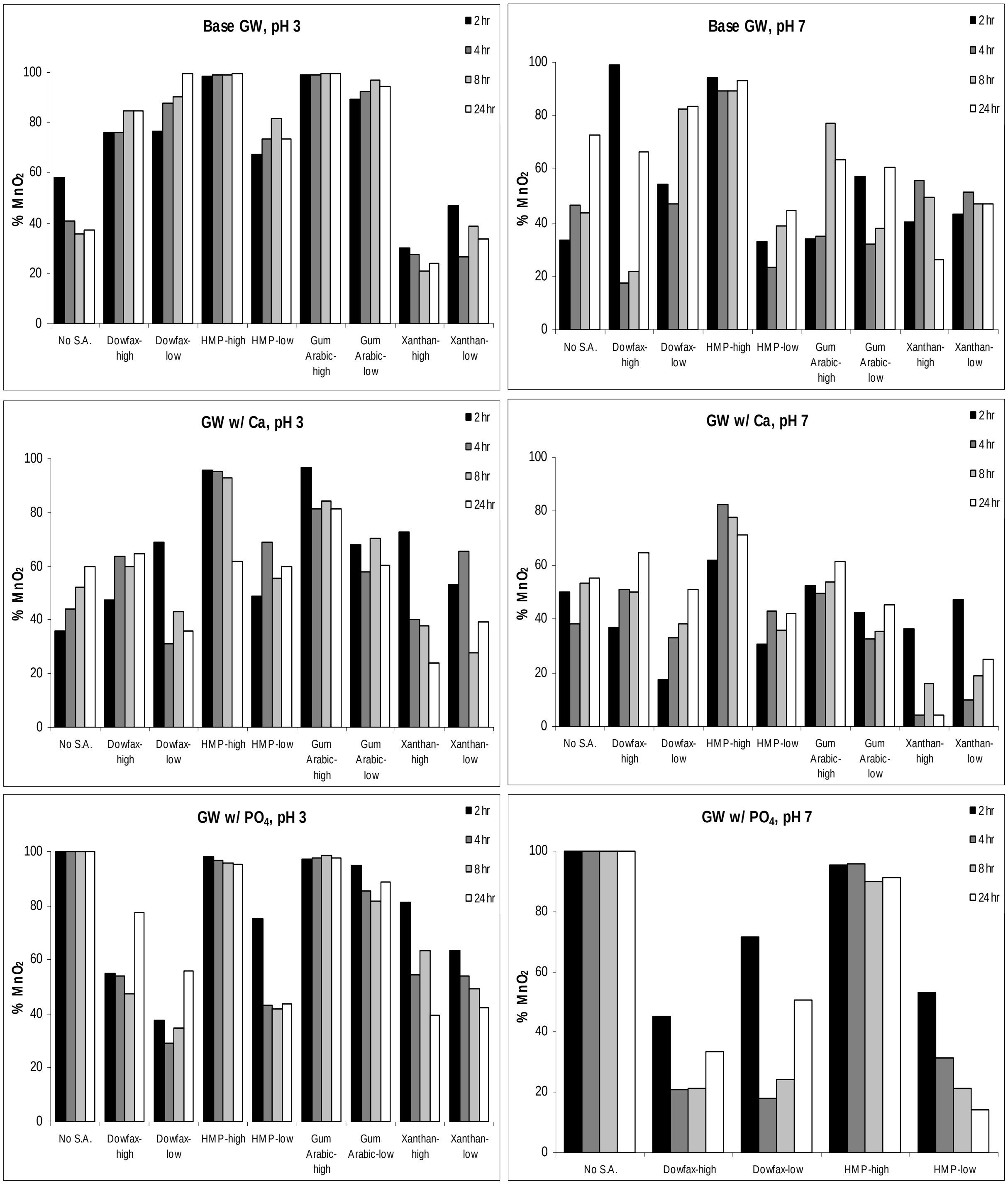
Particle size distribution of a high concentration stabilization aids under various reaction conditions at 2, 4, 8, 24 hour reaction time (particle size unit = µm) (page 2 of 4).



Particle size distribution of a high concentration stabilization aids under various reaction conditions at 2, 4, 8, 24 hour reaction time (particle size unit = μm) (page 3 of 4).

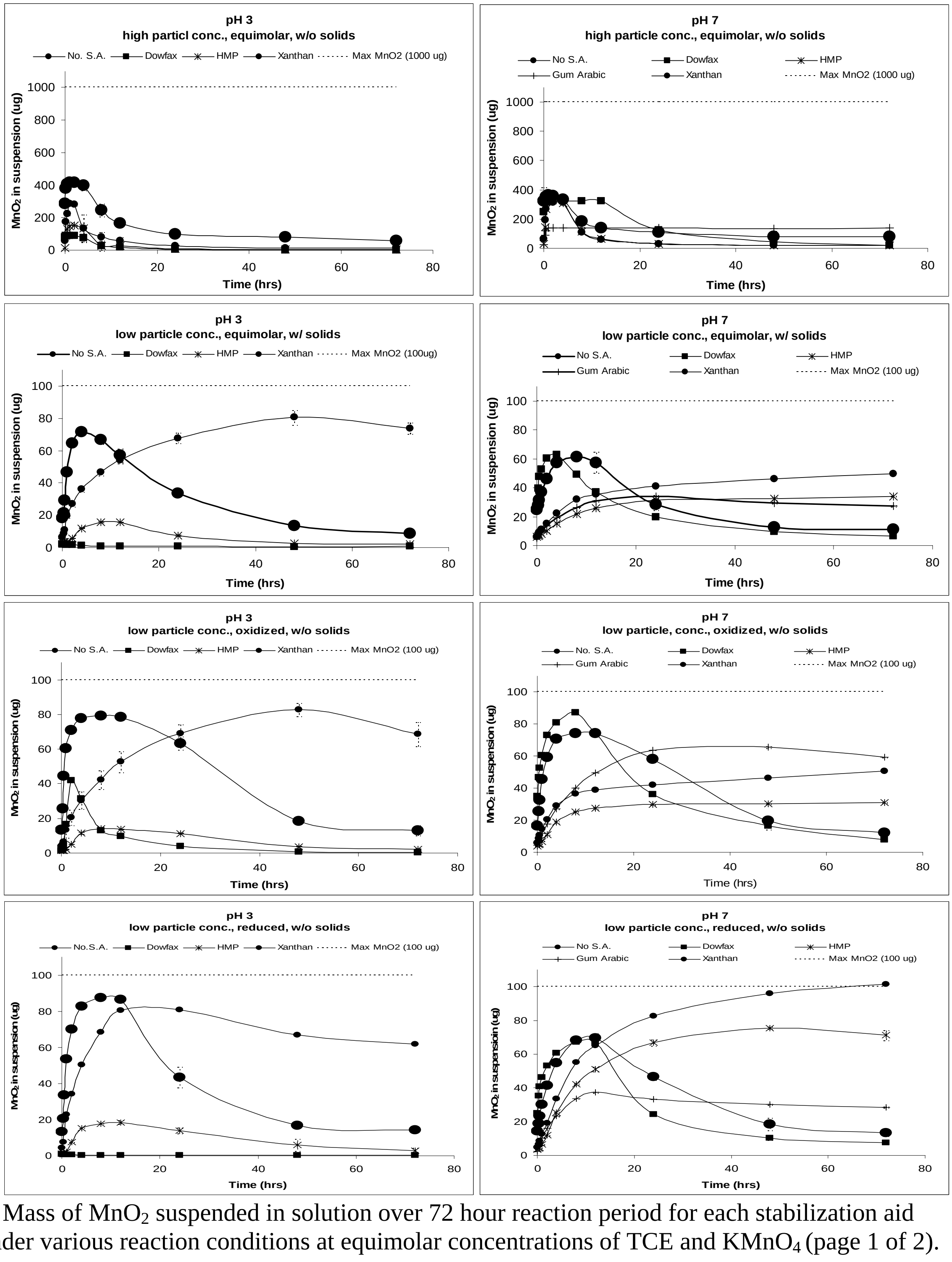


Particle size distribution of a high concentration stabilization aids under various reaction conditions at 2, 4, 8, 24 hour reaction time (particle size unit = µm) (page 4 of 4).

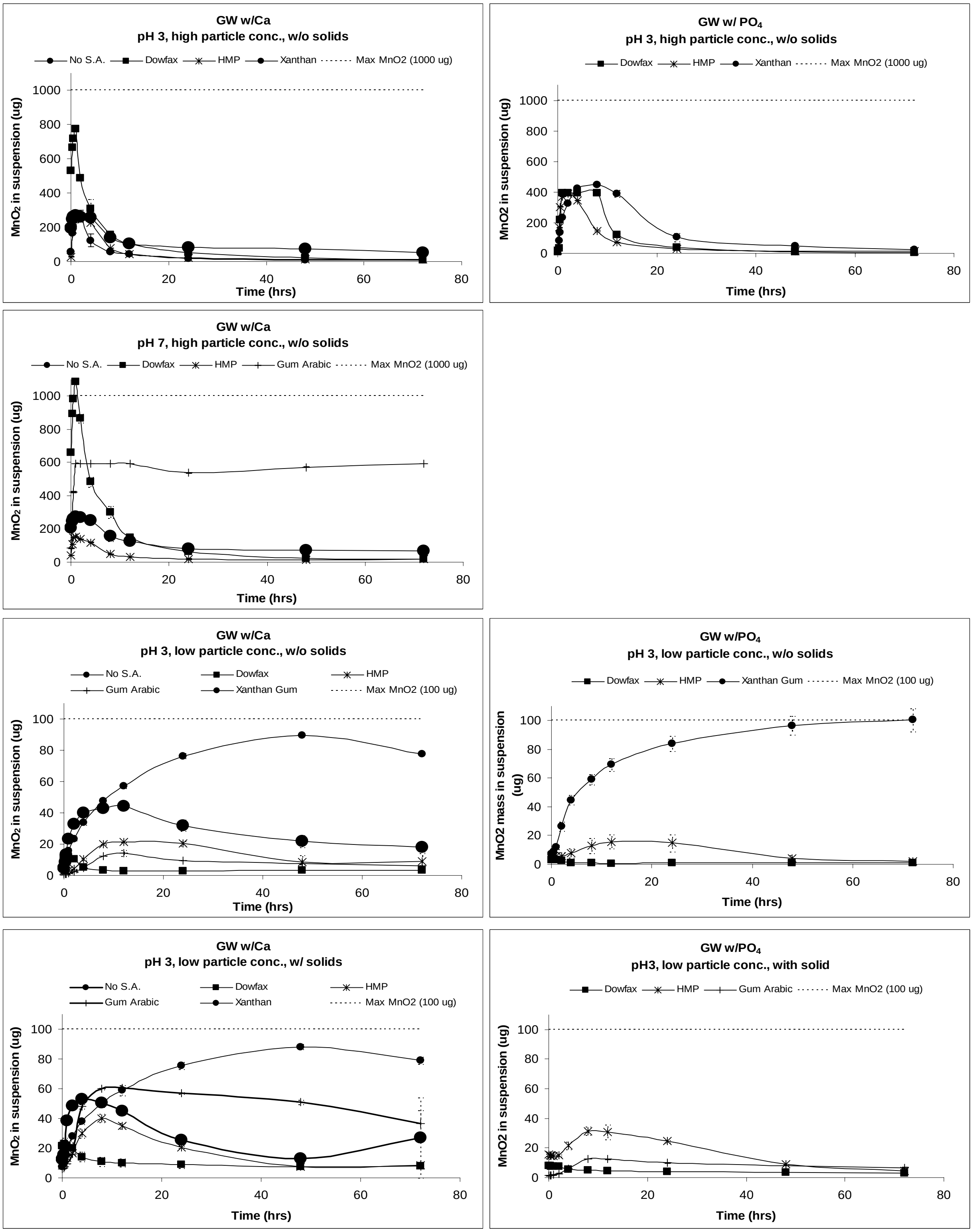


Percent of MnO_2 particles less than 0.1 µm over time for each stabilization aid.

Appendix VII. Suspended MnO_2 Concentration vs. Time



Mass of MnO_2 suspended in solution over 72 hour reaction period for each stabilization aid under various reaction conditions at equimolar concentrations of TCE and $KMnO_4$ (page 1 of 2).



Mass of MnO_2 suspended in solution over 72 hour reaction period for each stabilization aid under various reaction conditions at equimolar concentrations of TCE and $KMnO_4$ (page 2 of 2).

Appendix VIII. Average Particle Size and Zeta Potential vs. Reaction Conditions

No Stabilizaiton Aids

Maximum stoichiometric particle concentration (high = 100mg/L, low = 10mg/L	pH	Groundwater (Base, Ca-rich, or PO4-rich	Solids	Redox	Stabilization aid	Time (hours) 0 zeta potential	0 avg. particle size (µm)	0.5 zeta potential	0.5 avg. particle size (µm)	4 zeta potential	4 avg. particle size (µm)	24 zeta potential	24 avg. particle size (µm)	72 zeta potential	72 avg. particle size (µm)
low	7	Base	none	equimolar	none	-1.46	4.00	-8.90	2.47	-3.94	1.39	-5.13	8.96	-10.13	16.63
high	7	Base	none	equimolar	none	-12.48	0.70	-11.30	1.44	-10.07	3.03	-8.36	7.03	-9.66	23.91
low	3	Base	1.1g sand	equimolar	none	-11.27	0.72	-10.54	3.05	-9.39	3.49	-6.04	6.63	-4.69	6.28
high	3	Base	1.1g sand	equimolar	none	-9.27	*	-9.33	1.70	-7.69	3.58	-6.17	4.56	-9.67	3.15
low	7	Base	1.1g sand	equimolar	none	*	2.41	-9.66	2.47	-7.91	3.87	-5.25	6.02	-6.77	4.10
high	7	Base	1.1g sand	equimolar	none	-10.86	1.10	-11.53	1.80	-9.06	4.05	-8.75	10.06	-5.28	7.99
low	3	Base	none	oxidizing	none	-1.83	0.58	-5.47	0.79	-8.23	2.24	-6.95	6.55	-9.39	9.26
high	3	Base	none	oxidizing	none	-11.27	0.91	-9.25	1.37	-9.36	5.58	-8.50	9.16	-9.94	9.35
low	7	Base	none	oxidizing	none	-0.38	0.57	-0.83	0.72	-5.00	1.93	-5.68	1.56	-15.06	3.15
high	7	Base	none	oxidizing	none	-12.52	0.64	-10.60	1.10	-9.91	2.76	-9.94	3.54	-13.10	6.12
low	3	Base	1.1g sand	oxidizing	none	-8.14	1.79	-10.16	1.77	-8.09	3.22	-8.74	10.57	-7.52	10.00
high	3	Base	1.1g sand	oxidizing	none	-10.07	0.77	-9.11	2.36	-8.09	3.02	-9.20	5.11	-7.24	4.07
low	7	Base	1.1g sand	oxidizing	none	-5.67	1.82	-7.84	2.28	-6.07	3.51	-1.80	4.75	-4.63	3.15
high	7	Base	1.1g sand	oxidizing	none	-11.54	0.94	-9.00	1.57	-9.65	3.06	-10.08	4.21	-7.77	5.95
low	3	Ca	none	equimolar	none	*	0.62	-7.11	1.79	-9.26	4.09	-9.11	6.06	-4.81	6.79
high	3	Ca	none	equimolar	none	-8.29	1.00	-8.15	2.06	-8.20	7.50	-8.30	9.07	-7.07	24.33
low	7	Ca	none	equimolar	none	-0.02	1.49	*	1.72	-1.52	3.61	-1.62	9.56	-2.92	33.40
high	7	Ca	none	equimolar	none	-8.25	1.51	-8.80	1.85	-6.92	2.56	-5.54	6.66	-6.26	5.29
low	3	Ca	1.1g sand	equimolar	none	-6.58	15.85	-6.43	3.39	-6.93	6.02	-8.18	4.09	-6.10	9.23
high	3	Ca	1.1g sand	equimolar	none	-7.22	1.40	-6.06	2.41	-8.76	3.39	-6.83	4.49	-4.13	3.97
low	7	Ca	1.1g sand	equimolar	none	-3.97	10.26	-3.61	1.72	-2.72	6.13	-3.74	4.39	-1.62	6.27
high	7	Ca	1.1g sand	equimolar	none	-7.53	1.85	-7.39	2.22	-5.87	3.49	-5.75	12.48	-1.66	5.92
low	3	Ca	none	oxidizing	none	-3.11	0.74	-9.14	1.15	-7.76	2.27	-7.10	8.22	-7.64	34.09
high	3	Ca	none	oxidizing	none	-6.76	1.11	-7.37	1.65	-7.70	2.71	-7.75	6.05	-8.72	8.16
low	7	Ca	none	oxidizing	none	-0.55	0.43	-1.15	0.62	-3.01	2.58	-1.03	4.02	-6.96	12.15
high	7	Ca	none	oxidizing	none	-5.14	0.72	-5.35	1.15	-2.91	2.51	-2.73	3.80	-2.50	6.98
low	3	Ca	1.1g sand	oxidizing	none	-9.14	1.64	-9.26	2.85	-7.95	3.02	-6.30	3.66	-6.66	5.32
high	3	Ca	1.1g sand	oxidizing	none	-7.73	1.59	-0.03	1.82	-7.78	2.48	-5.39	7.03	-4.88	2.54
low	7	Ca	1.1g sand	oxidizing	none	-5.55	1.72	-3.19	2.71	-2.19	4.20	-1.83	3.94	-0.63	3.03
high	7	Ca	1.1g sand	oxidizing	none	-6.46	0.89	-3.75	2.17	-2.82	3.88	-2.09	7.26	-0.26	8.63
low	3	PO4	none	equimolar	none	-3.91	1.67	-8.31	5.69	-9.11	2.17	-14.51	3.24	-16.80	7.04
high	3	PO4	none	equimolar	none	-14.74	1.02	-12.52	0.65	-14.44	1.62	-13.54	2.56	-19.61	5.53
low	3	PO4	1.1g sand	equimolar	none	-9.72	3.66	-12.12	1.43	-8.24	2.89	-8.60	3.88	-11.29	9.46
high	3	PO4	1.1g sand	equimolar	none	-17.46	0.28	-15.05	0.32	-15.47	1.81	-12.94	2.60	-17.69	10.19
low	3	PO4	none	oxidizing	none	-0.65	*	-4.35	1.06	-8.90	1.93	-14.84	2.56	*	11.48
high	3	PO4	none	oxidizing	none	-17.22	0.16	-16.31	0.28	-17.39	1.21	-17.84	2.05	*	3.60
low	3	PO4	1.1g sand	oxidizing	none	-15.53	1.64	-12.78	2.16	-6.92	2.51	-3.77	5.80	*	8.76
high	3	PO4	1.1g sand	oxidizing	none	-13.98	0.25	-18.42	0.37	-14.47	1.58	-18.04	3.50	*	6.83
low	7	PO4	none	equimolar	none	-0.30	1.69	-7.50	1.26	-7.44	2.15	-12.65	2.01	-14.88	1.89
high	7	PO4	none	equimolar	none	-12.27	1.90	-14.50	1.62	-17.83	3.25	-14.77	4.00	-17.83	4.67
low	7	PO4	1.1g sand	equimolar	none	-12.20	2.07	-12.49	2.36	-11.36	3.38	-9.07	3.50	-10.83	3.64
high	7	PO4	1.1g sand	equimolar	none	-12.74	1.32	-14.12	2.17	-18.15	2.91	-15.08	1.94	-17.41	1.89
low	7	PO4	none	oxidizing	none	-0.19	*	-1.31	0.98	-7.22	3.07	-8.27	2.25	*	4.52
high	7	PO4	none	oxidizing	none	-13.04	0.50	-13.26	1.30	-14.90	2.93	-14.17	3.44	*	4.60
low	7	PO4	1.1g sand	oxidizing	none	-7.39	3.25	-12.36	3.38	-11.13	5.36	-2.39	4.08	*	1.48
high	7	PO4	1.1g sand	oxidizing	none	-14.05	1.71	-12.00	1.91	-14.22	2.74	-20.24	3.62	*	2.08

*data unavailable

Dowfax

Maximum stoichiometric particle concentration (high = 100mg/L, low = 10mg/L	pH	Groundwater (Base, Ca-rich, or PO4-rich	Solids	Redox	Stabilization aid	Time (hours)									
						0		0.5		4		24		72	
						zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)
low	3	Base	none	equimolar	214uL Dowfax	-14.91	2.22	-19.89	2.63	-31.26	1.98	-28.15	1.31	-15.67	1.12
high	3	Base	none	equimolar	214uL Dowfax	-28.67	0.96	-26.55	0.66	-24.82	2.24	-31.16	13.14	-19.55	72.36
low	7	Base	none	equimolar	214uL Dowfax	-28.48	0.19	-33.06	0.95	-33.27	8.19	-28.75	10.35	-24.40	5.80
high	7	Base	none	equimolar	214uL Dowfax	-27.51	0.16	-0.38	0.64	-32.92	0.99	-28.10	11.40	-22.25	23.80
low	3	Base	1.1g sand	equimolar	214uL Dowfax	-43.74	1.01	-38.64	1.21	-49.75	1.39	-42.78	0.59	-31.03	0.64
high	3	Base	1.1g sand	equimolar	214uL Dowfax	-29.73	0.67	-27.63	0.83	-24.35	1.59	-29.74	4.36	-20.73	1.62
low	7	Base	1.1g sand	equimolar	214uL Dowfax	-38.84	1.56	-35.06	3.45	-32.39	45.93	-25.03	4.08	-13.13	6.97
high	7	Base	1.1g sand	equimolar	214uL Dowfax	-34.50	0.25	-31.36	0.27	-29.52	2.11	-26.86	11.89	-23.13	7.61
low	3	Base	none	oxidizing	214uL Dowfax	-2.42	0.65	-22.16	0.32	-28.91	25.08	-17.64	7.26	-7.43	*
high	3	Base	none	oxidizing	214uL Dowfax	-30.17	0.25	-29.20	0.54	-24.40	1.66	-24.67	4.23	-33.58	1.67
low	7	Base	none	oxidizing	214uL Dowfax	-24.24	0.41	-18.22	1.24	-30.63	18.42	-33.00	8.34	-31.00	6.79
high	7	Base	none	oxidizing	214uL Dowfax	-25.55	0.09	-31.97	0.16	-29.74	8.69	-27.67	22.90	-27.67	21.58
low	3	Base	1.1g sand	oxidizing	214uL Dowfax	-32.69	0.90	-27.04	0.47	-28.84	6.19	-27.38	5.64	-27.38	3.54
high	3	Base	1.1g sand	oxidizing	214uL Dowfax	-35.77	0.31	-29.11	0.90	-27.19	3.34	-23.34	15.67	-31.77	35.04
low	7	Base	1.1g sand	oxidizing	214uL Dowfax	-28.10	1.76	-29.25	3.92	-30.00	8.86	-32.72	8.65	-27.71	8.47
high	7	Base	1.1g sand	oxidizing	214uL Dowfax	-39.16	0.18	-33.98	0.25	-30.22	10.85	-30.23	3.52	-26.45	19.12
low	3	Ca	none	equimolar	214uL Dowfax	-20.03	0.77	-37.26	1.69	-40.17	4.79	-41.88	0.82	-35.44	0.83
high	3	Ca	none	equimolar	214uL Dowfax	-20.87	8.56	-17.69	13.97	-21.21	42.13	-23.76	34.15	-15.30	1.47
low	7	Ca	none	equimolar	214uL Dowfax	-10.16	0.18	-30.30	2.37	-33.69	13.30	-20.46	17.34	-20.20	13.60
high	7	Ca	none	equimolar	214uL Dowfax	-20.35	1.72	-24.35	18.78	-28.11	2.04	-21.00	0.94	-21.11	0.69
low	3	Ca	1.1g sand	equimolar	214uL Dowfax	-44.42	1.45	-33.37	1.50	-37.38	2.96	-43.25	0.65	-22.19	0.57
high	3	Ca	1.1g sand	equimolar	214uL Dowfax	-17.86	8.55	-19.31	8.87	-21.91	17.60	-22.07	4.77	-17.98	14.00
low	7	Ca	1.1g sand	equimolar	214uL Dowfax	-25.31	2.90	-32.03	3.62	-32.42	6.59	-23.83	5.85	-14.11	3.63
high	7	Ca	1.1g sand	equimolar	214uL Dowfax	-20.52	4.39	-23.87	17.87	-28.15	1.18	-19.98	17.87	-20.88	0.64
low	3	Ca	none	oxidizing	214uL Dowfax	-28.35	7.75	-28.20	8.81	-31.29	4.23	-31.18	4.23	-35.52	4.82
high	3	Ca	none	oxidizing	214uL Dowfax	-14.48	1.33	-16.27	2.49	-25.43	10.50	-28.45	1.15	-26.24	*
low	7	Ca	none	oxidizing	214uL Dowfax	-27.24	1.67	-31.47	8.67	-27.36	13.54	-29.49	6.52	-31.54	4.27
high	7	Ca	none	oxidizing	214uL Dowfax	-19.95	3.78	-27.39	8.91	-27.24	9.10	-25.62	0.72	-22.97	0.67
low	3	Ca	1.1g sand	oxidizing	214uL Dowfax	-48.05	1.06	-42.12	*	-31.87	5.63	-33.97	11.70	-34.85	2.73
high	3	Ca	1.1g sand	oxidizing	214uL Dowfax	-18.84	2.93	-18.92	1.98	-25.76	3.46	-27.37	0.62	-23.40	0.75
low	7	Ca	1.1g sand	oxidizing	214uL Dowfax	-21.74	0.78	-31.51	3.36	-28.81	5.73	-31.11	4.51	-29.53	117.15
high	7	Ca	1.1g sand	oxidizing	214uL Dowfax	-22.23	5.73	-23.25	4.87	-27.62	1.20	-27.04	0.71	-22.58	1.04
low	3	PO4	none	equimolar	214uL Dowfax	-33.86	0.75	-36.68	1.04	-50.21	1.24	*	47.07	*	*
high	3	PO4	none	equimolar	214uL Dowfax	-13.34	14.30	-16.95	0.11	-28.14	0.53	*	9.10	*	*
low	3	PO4	1.1g sand	equimolar	214uL Dowfax	-35.07	0.84	-38.51	0.82	-45.84	0.88	*	0.59	*	*
high	3	PO4	1.1g sand	equimolar	214uL Dowfax	-31.97	0.66	-21.95	0.26	-27.96	2.03	*	25.02	*	*
low	3	PO4	none	oxidizing	214uL Dowfax	-7.17	*	-6.96	28.60	-25.24	2.73	-21.42	3.09	-29.10	0.58
high	3	PO4	none	oxidizing	214uL Dowfax	-24.82	9.78	-22.03	*	-27.05	1.17	-19.72	1.58	-27.09	1.72
low	3	PO4	1.1g sand	oxidizing	214uL Dowfax	-29.86	0.79	-30.81	1.65	-33.05	12.15	-12.93	2.28	-1.88	1.40
high	3	PO4	1.1g sand	oxidizing	214uL Dowfax	-12.67	3.38	-26.82	5.62	-28.28	3.28	-17.23	2.45	-24.33	1.51
low	7	PO4	none	equimolar	214uL Dowfax	*	0.11	-16.31	0.21	-31.80	2.53	-32.98	9.10	-21.01	9.10
high	7	PO4	none	equimolar	214uL Dowfax	-24.19	1.03	-21.01	2.86	-25.50	2.99	-28.13	1.56	-26.98	1.18
low	7	PO4	1.1g sand	equimolar	214uL Dowfax	-48.16	1.18	-36.78	0.81	-34.91	5.42	-30.22	5.15	-24.00	2.88
high	7	PO4	1.1g sand	equimolar	214uL Dowfax	-31.70	2.10	-29.24	5.47	-27.97	4.91	-28.57	2.75	-25.30	1.13
low	7	PO4	none	oxidizing	214uL Dowfax	-0.21	0.18	-3.49	0.31	-21.33	1.69	-26.05	1.85	-29.78	0.70
high	7	PO4	none	oxidizing	214uL Dowfax	-26.59	2.10	-26.40	3.26	-25.94	3.22	-29.77	2.49	-27.34	1.93
low	7	PO4	1.1g sand	oxidizing	214uL Dowfax	-40.85	1.31	-39.03	2.37	-32.56	9.07	-29.79	5.15	-28.77	3.52
high	7	PO4	1.1g sand	oxidizing	214uL Dowfax	-29.14	2.05	-29.27	2.96	-28.98	3.46	-28.26	1.32	-29.50	1.42

*data unavailable

HMP

Maximum stoichiometric particle concentration (high = 100mg/L, low = 10mg/L	pH	Groundwater (Base, Ca-rich, or PO4-rich	Solids	Redox	Stabilization aid	Time (hours)									
						0		0.5		4		24		72	
						zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)
low	3	Base	none	equimolar	1000mg/L HMP	-2.26	*	-0.72	1.87	-1.35	3.22	-4.36	3.67	-4.36	*
high	3	Base	none	equimolar	1000mg/L HMP	-8.83	0.29	-17.14	2.10	-25.87	2.04	-29.51	1.21	-31.21	3.16
low	3	Base	1.1g sand	equimolar	1000mg/L HMP	-42.85	0.81	-34.39	1.28	-39.93	0.53	-32.25	0.94	-31.64	0.44
high	3	Base	1.1g sand	equimolar	1000mg/L HMP	-29.70	0.74	-31.25	1.68	-33.02	3.69	-33.29	0.41	-19.23	0.59
low	3	Base	none	oxidizing	1000mg/L HMP	-2.37	0.00	-9.85	0.00	-18.51	0.00	-12.10	0.00	-16.46	*
high	3	Base	none	oxidizing	1000mg/L HMP	-14.79	0.00	-20.06	0.00	-30.52	0.00	-35.73	0.00	-15.51	*
low	3	Base	1.1g sand	oxidizing	1000mg/L HMP	-41.85	0.77	-46.99	0.61	-46.99	0.72	-42.37	0.41	-42.54	0.23
high	3	Base	1.1g sand	oxidizing	1000mg/L HMP	-42.41	2.22	-44.26	2.79	-42.24	0.76	-44.24	0.45	-16.09	0.25
low	7	Base	none	equimolar	1000mg/L HMP	-14.06	*	-14.40	7.99	-20.46	5.84	-10.42	1.61	-0.25	0.11
high	7	Base	none	equimolar	1000mg/L HMP	-6.36	*	-6.82	1.36	-29.03	7.99	-16.46	0.24	-24.65	2.27
low	7		1.1g sand	equimolar	1000mg/L HMP	-43.78	0.45	-54.30	0.46	-52.30	0.61	-50.38	0.46	-45.02	0.34
high	7	Base	1.1g sand	equimolar	1000mg/L HMP	-48.90	0.62	-50.19	1.26	-52.11	0.67	-48.49	0.46	-23.81	0.40
low	7	Base	none	oxidizing	1000mg/L HMP	-27.13	0.00	-13.55	0.00	-20.88	0.00	-19.05	0.00	-21.85	*
high	7	Base	none	oxidizing	1000mg/L HMP	-10.15	0.00	-18.12	0.00	-22.12	0.00	-18.75	0.00	-1.76	*
low	7	Base	1.1g sand	oxidizing	1000mg/L HMP	-55.69	0.69	-54.83	0.55	-53.19	0.78	-50.51	0.74	-48.47	0.35
high	7	Base	1.1g sand	oxidizing	1000mg/L HMP	-53.40	0.86	-52.96	0.67	-22.64	0.92	-51.69	1.34	-31.54	0.79
low	3	Ca	none	equimolar	1000mg/L HMP	-13.73	0.00	-6.26	0.00	-15.76	0.00	-0.17	0.00	-0.03	*
high	3	Ca	none	equimolar	1000mg/L HMP	-0.59	0.00	-0.33	0.00	-7.27	0.00	-0.41	0.00	-1.76	*
low	3	Ca	1.1g sand	equimolar	1000mg/L HMP	-34.68	0.76	-34.75	1.00	-31.63	0.72	-29.75	0.60	-27.08	0.43
high	3	Ca	1.1g sand	equimolar	1000mg/L HMP	-46.38	0.83	-43.78	0.80	-38.52	0.73	-33.36	0.54	-29.63	0.35
low	3	Ca	none	oxidizing	1000mg/L HMP	-10.14	0.00	-2.21	0.00	-1.83	0.00	-4.34	0.00	-19.03	*
high	3	Ca	none	oxidizing	1000mg/L HMP	-0.13	0.00	-11.31	0.00	-21.33	0.00	-19.48	0.00	-18.66	*
low	3	Ca	1.1g sand	oxidizing	1000mg/L HMP	-44.65	1.18	-45.46	0.96	-50.70	*	-42.28	0.59	-37.99	0.76
high	3	Ca	1.1g sand	oxidizing	1000mg/L HMP	-19.57	3.92	-20.20	2.74	-21.17	*	-22.76	0.94	-5.53	*
low	7	Ca	none	equimolar	1000mg/L HMP	-0.21	0.00	-3.47	0.00	-1.44	0.00	-4.45	0.00	-2.59	*
high	7	Ca	none	equimolar	1000mg/L HMP	-17.77	0.27	-21.04	0.29	-22.23	0.32	-23.53	0.32	-15.58	*
low	7	Ca	1.1g sand	equimolar	1000mg/L HMP	-51.48	0.88	-50.70	0.91	-53.20	0.73	-51.53	0.51	-41.77	*
high	7	Ca	1.1g sand	equimolar	1000mg/L HMP	-18.56	0.60	-20.24	0.52	-21.98	0.52	-24.38	0.89	-14.69	*
low	7	Ca	none	oxidizing	1000mg/L HMP	-20.88	0.00	-1.83	0.00	-6.15	0.00	-11.47	0.00	-21.16	*
high	7	Ca	none	oxidizing	1000mg/L HMP	-22.12	0.61	-21.33	0.77	-20.11	0.66	-23.06	0.71	-21.71	*
low	7	Ca	1.1g sand	oxidizing	1000mg/L HMP	-53.19	0.82	-50.70	0.78	-49.33	0.78	-19.38	1.01	-47.88	0.88
high	7	Ca	1.1g sand	oxidizing	1000mg/L HMP	-22.64	0.96	-21.17	0.75	-21.93	0.64	-22.82	1.33	-23.70	0.62
low	3	PO4	none	equimolar	1000mg/L HMP	-4.47	0.00	-25.70	0.00	-20.35	0.00	-10.28	0.00	-1.21	*
high	3	PO4	none	equimolar	1000mg/L HMP	-11.46	0.00	-24.74	0.00	-24.51	0.00	-16.64	0.12	-23.72	0.33
low	3	PO4	1.1g sand	equimolar	1000mg/L HMP	-38.18	0.54	-36.37	0.65	-40.32	0.56	-38.83	0.28	-39.07	0.44
high	3	PO4	1.1g sand	equimolar	1000mg/L HMP	-36.70	0.47	-37.43	0.59	-38.83	0.60	-33.88	0.34	-24.49	0.29
low	3	PO4	none	oxidizing	1000mg/L HMP	-9.63	0.00	-23.31	0.00	-1.98	0.00	-5.88	0.00	-16.31	*
high	3	PO4	none	oxidizing	1000mg/L HMP	-14.39	0.00	-0.06	0.00	-1.07	0.00	-2.83	0.00	-28.26	0.50
low	3	PO4	1.1g sand	oxidizing	1000mg/L HMP	-43.81	0.44	-44.05	0.49	-41.13	0.58	-40.43	0.67	-35.93	0.87
high	3	PO4	1.1g sand	oxidizing	1000mg/L HMP	-37.48	0.70	-38.58	0.57	-37.09	0.54	-35.15	0.70	-27.70	1.39
low	7	PO4	none	equimolar	1000mg/L HMP	-0.03	0.00	-1.59	0.00	-11.71	0.00	-12.46	0.00	-0.57	*
high	7	PO4	none	equimolar	1000mg/L HMP	-10.96	0.00	-25.82	0.26	-1.02	0.24	-17.58	0.23	-25.40	0.23
low	7	PO4	1.1g sand	equimolar	1000mg/L HMP	-48.08	0.80	-50.99	0.80	-51.33	1.38	-49.41	0.56	-31.91	0.42
high	7	PO4	1.1g sand	equimolar	1000mg/L HMP	-36.77	0.75	-42.87	0.65	-43.63	0.65	-33.54	0.69	-25.08	7.02
low	7	PO4	none	oxidizing	1000mg/L HMP	-0.55	0.00	-7.89	0.00	-8.31	0.00	-12.48	0.00	-6.51	*
high	7	PO4	none	oxidizing	1000mg/L HMP	-22.48	0.00	-26.69	0.00	-19.46	0.00	-27.82	0.00	-25.03	*
low	7	PO4	1.1g sand	oxidizing	1000mg/L HMP	-54.24	1.74	-51.43	0.98	-52.58	1.57	-49.75	1.08	-52.87	1.70
high	7	PO4	1.1g sand	oxidizing	1000mg/L HMP	-45.47	1.28	-45.70	1.44	-46.57	1.32	-42.69	1.16	-34.49	1.26

*data unavailable

Gum Arabic

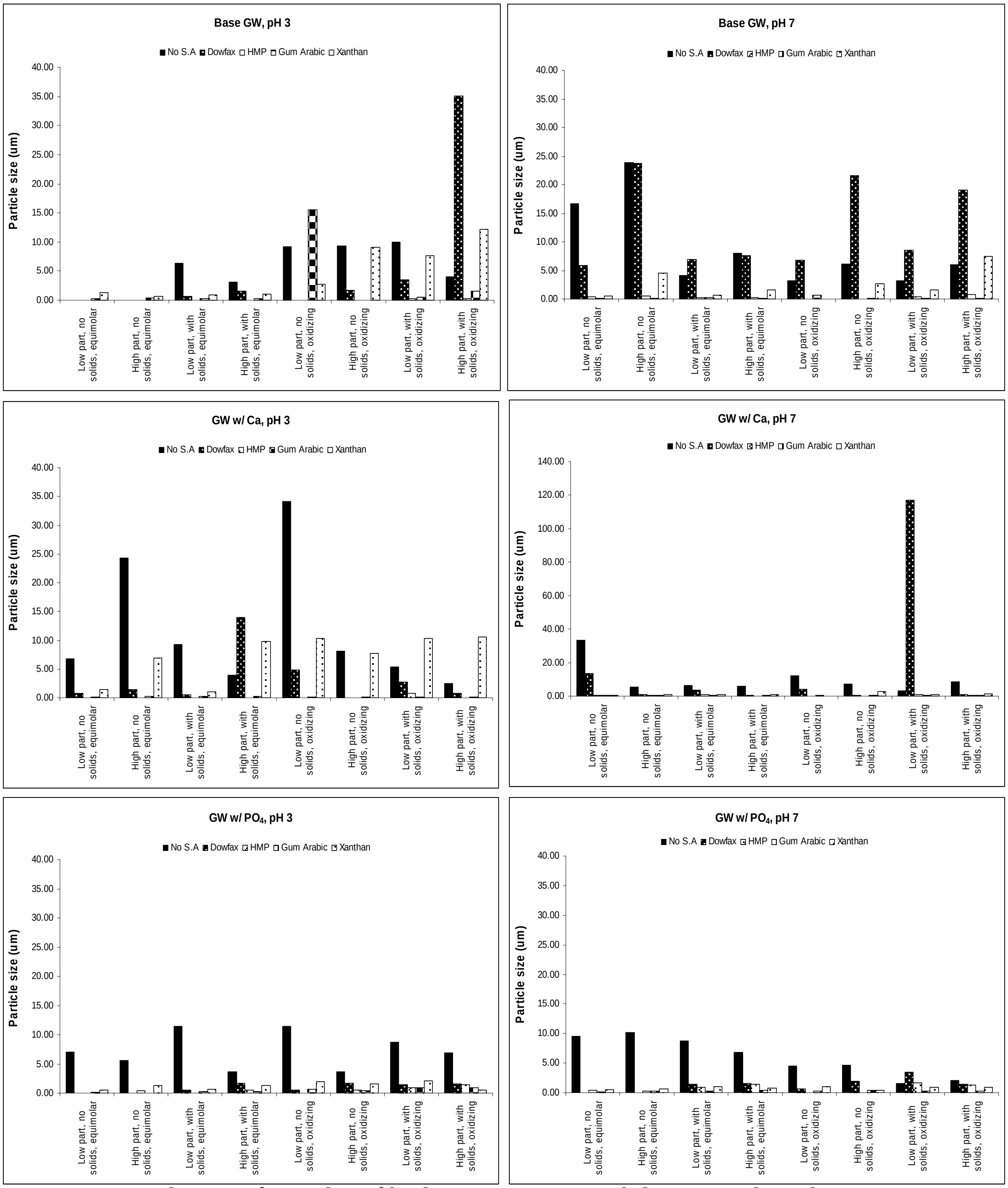
Maximum stoichiometric particle concentration (high = 100mg/L, low = 10mg/L	pH	Groundwater (Base, Ca-rich, or PO4-rich	Solids	Redox	Stabilization aid	Time (hours)									
						0		0.5		4		24		72	
						zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)
low	3	Base	none	equimolar	1000mg/L Gum Arabic	-1.85	0.00	-4.36	0.00	-8.92	0.32	-8.81	0.23	-7.98	0.20
high	3	Base	none	equimolar	1000mg/L Gum Arabic	-7.23	0.00	-7.97	0.00	-8.14	0.48	-8.62	0.25	-8.76	0.39
low	3	Base	1.1g sand	equimolar	1000mg/L Gum Arabic	-11.97	0.18	-6.37	0.24	-12.26	0.44	-12.60	0.26	-13.39	0.26
high	3	Base	1.1g sand	equimolar	1000mg/L Gum Arabic	-10.32	0.15	-12.20	0.28	-11.60	0.33	-13.20	0.30	-14.40	0.26
low	3	Base	none	oxidizing	1000mg/L Gum Arabic	-8.39	0.00	-7.47	0.00	-14.46	17.15	-8.42	0.75	-8.65	15.55
high	3	Base	none	oxidizing	1000mg/L Gum Arabic	-13.82	32.22	-14.80	12.13	-17.62	12.28	-17.04	1.93	-10.59	*
low	3	Base	1.1g sand	oxidizing	1000mg/L Gum Arabic	-14.85	3.57	-15.70	2.37	-17.00	2.82	-16.55	0.42	-13.37	0.49
high	3	Base	1.1g sand	oxidizing	1000mg/L Gum Arabic	-29.70	7.81	-15.72	2.63	-17.00	7.42	-16.74	0.81	-13.37	1.61
low	7	Base	none	equimolar	1000mg/L Gum Arabic	-6.64	0.00	-8.09	0.00	-11.14	0.18	-12.19	0.25	-12.18	0.17
high	7	Base	none	equimolar	1000mg/L Gum Arabic	-11.22	0.00	-11.75	0.22	-11.91	0.41	-13.40	0.29	-6.68	0.18
low	7	Base	1.1g sand	equimolar	1000mg/L Gum Arabic	-12.66	26.46	-13.91	2.86	-14.15	1.73	-13.93	0.25	-16.26	0.23
high	7	Base	1.1g sand	equimolar	1000mg/L Gum Arabic	-13.15	9.76	-12.50	0.60	-12.81	0.49	-14.20	0.30	-16.40	0.19
low	7	Base	none	oxidizing	1000mg/L Gum Arabic	-13.94	0.00	-9.93	0.00	-14.07	0.42	-16.89	0.49	-17.27	0.72
high	7	Base	none	oxidizing	1000mg/L Gum Arabic	-15.84	0.82	-16.95	0.40	-17.59	0.48	-20.50	0.22	-21.58	0.10
low	7	Base	1.1g sand	oxidizing	1000mg/L Gum Arabic	-16.83	1.87	-16.57	0.19	-16.63	2.10	-16.15	0.45	-18.81	0.14
high	7	Base	1.1g sand	oxidizing	1000mg/L Gum Arabic	-17.04	0.76	-17.76	0.52	-18.46	0.57	-20.15	0.35	-19.67	0.12
low	3	Ca	none	equimolar	1000mg/L Gum Arabic	-5.00	0.00	-0.57	0.00	-6.44	0.00	-1.82	0.19	-8.81	0.17
high	3	Ca	none	equimolar	1000mg/L Gum Arabic	-3.90	0.00	-2.41	0.00	-6.20	0.16	-6.47	0.22	-4.59	0.20
low	3	Ca	1.1g sand	equimolar	1000mg/L Gum Arabic	-10.63	7.62	-10.47	3.52	-11.27	0.98	-7.55	0.24	-16.88	0.22
high	3	Ca	1.1g sand	equimolar	1000mg/L Gum Arabic	-6.59	19.49	-7.81	2.18	-7.96	0.64	-8.00	0.27	-6.82	0.26
low	3	Ca	none	oxidizing	1000mg/L Gum Arabic	-10.22	0.00	-13.86	0.00	-14.81	0.51	-17.83	0.60	-17.66	0.11
high	3	Ca	none	oxidizing	1000mg/L Gum Arabic	-6.93	0.00	-10.41	1.21	-11.58	1.10	-12.35	0.76	-12.53	0.11
low	3	Ca	1.1g sand	oxidizing	1000mg/L Gum Arabic	-13.80	2.44	-14.39	1.02	-15.36	0.66	-18.21	0.52	-16.44	0.09
high	3	Ca	1.1g sand	oxidizing	1000mg/L Gum Arabic	-9.83	3.28	-10.82	1.06	-11.97	0.96	-10.80	0.74	-12.96	0.07
low	7	Ca	none	equimolar	1000mg/L Gum Arabic	-7.40	0.00	-9.28	0.34	-11.68	0.26	-9.75	0.19	-11.42	0.23
high	7	Ca	none	equimolar	1000mg/L Gum Arabic	-4.16	0.00	-8.06	0.28	-9.15	0.30	-8.64	0.20	-10.06	0.25
low	7	Ca	1.1g sand	equimolar	1000mg/L Gum Arabic	-12.09	1.30	-11.52	0.52	-14.30	0.36	-15.22	0.43	-20.86	0.33
high	7	Ca	1.1g sand	equimolar	1000mg/L Gum Arabic	-7.15	0.45	-7.40	0.30	-6.62	0.74	-9.33	0.20	-14.14	0.26
low	7	Ca	none	oxidizing	1000mg/L Gum Arabic	-12.30	0.00	-7.34	0.00	-9.47	0.10	*	0.37	-14.40	0.29
high	7	Ca	none	oxidizing	1000mg/L Gum Arabic	-10.16	0.00	-9.33	0.87	-8.21	0.28	*	0.28	-12.22	0.27
low	7	Ca	1.1g sand	oxidizing	1000mg/L Gum Arabic	-15.31	4.29	-16.08	1.43	-12.16	0.90	*	0.54	-16.03	0.24
high	7	Ca	1.1g sand	oxidizing	1000mg/L Gum Arabic	-9.49	1.94	-10.41	0.93	-8.85	0.52	*	0.28	-11.67	0.23
low	3	PO4	none	equimolar	1000mg/L Gum Arabic	-7.41	0.00	-4.64	0.00	-5.75	0.23	-10.40	0.37	-10.17	0.19
high	3	PO4	none	equimolar	1000mg/L Gum Arabic	-4.44	0.00	-4.38	0.00	-5.94	0.20	-11.45	0.33	-9.89	*
low	3	PO4	1.1g sand	equimolar	1000mg/L Gum Arabic	-12.87	2.70	-13.13	1.84	-14.68	0.35	-14.93	0.34	-15.53	0.24
high	3	PO4	1.1g sand	equimolar	1000mg/L Gum Arabic	-9.06	1.69	-9.95	0.72	-12.64	0.56	-15.15	0.66	-15.89	0.30
low	3	PO4	none	oxidizing	1000mg/L Gum Arabic	-9.38	0.00	-9.03	0.00	-9.44	*	*	0.78	-15.06	0.68
high	3	PO4	none	oxidizing	1000mg/L Gum Arabic	-9.63	0.00	-10.15	0.00	-12.32	0.30	-17.20	0.34	-17.88	0.44
low	3	PO4	1.1g sand	oxidizing	1000mg/L Gum Arabic	-13.78	2.66	-14.51	2.27	-15.04	0.96	-13.85	0.69	-12.32	0.89
high	3	PO4	1.1g sand	oxidizing	1000mg/L Gum Arabic	-12.83	4.50	-12.96	2.73	-16.81	0.47	-17.60	0.91	-17.13	0.86
low	7	PO4	none	equimolar	1000mg/L Gum Arabic	-5.99	0.00	-11.44	0.00	-14.02	0.18	-2.75	0.18	-14.78	0.16
high	7	PO4	none	equimolar	1000mg/L Gum Arabic	-12.71	0.00	-14.74	0.62	-14.81	0.47	-18.74	0.52	-17.00	0.30
low	7	PO4	1.1g sand	equimolar	1000mg/L Gum Arabic	-18.05	1.48	-18.61	1.13	-17.68	0.60	-16.77	0.37	-18.15	0.20
high	7	PO4	1.1g sand	equimolar	1000mg/L Gum Arabic	-18.92	1.50	-18.89	0.78	-18.79	0.68	-15.13	0.54	-18.13	0.35
low	7	PO4	none	oxidizing	1000mg/L Gum Arabic	*	0.00	-13.63	0.00	-13.74	0.00	-14.98	0.41	-12.00	0.25
high	7	PO4	none	oxidizing	1000mg/L Gum Arabic	-15.96	0.00	-16.75	0.00	-16.20	1.20	-18.47	0.81	-22.06	0.35
low	7	PO4	1.1g sand	oxidizing	1000mg/L Gum Arabic	-17.61	3.33	-16.20	1.48	*	1.04	-17.02	0.83	-18.56	0.26
high	7	PO4	1.1g sand	oxidizing	1000mg/L Gum Arabic	-18.03	2.85	-16.82	1.22	*	0.83	*	0.66	-20.34	0.30

*data unavailable

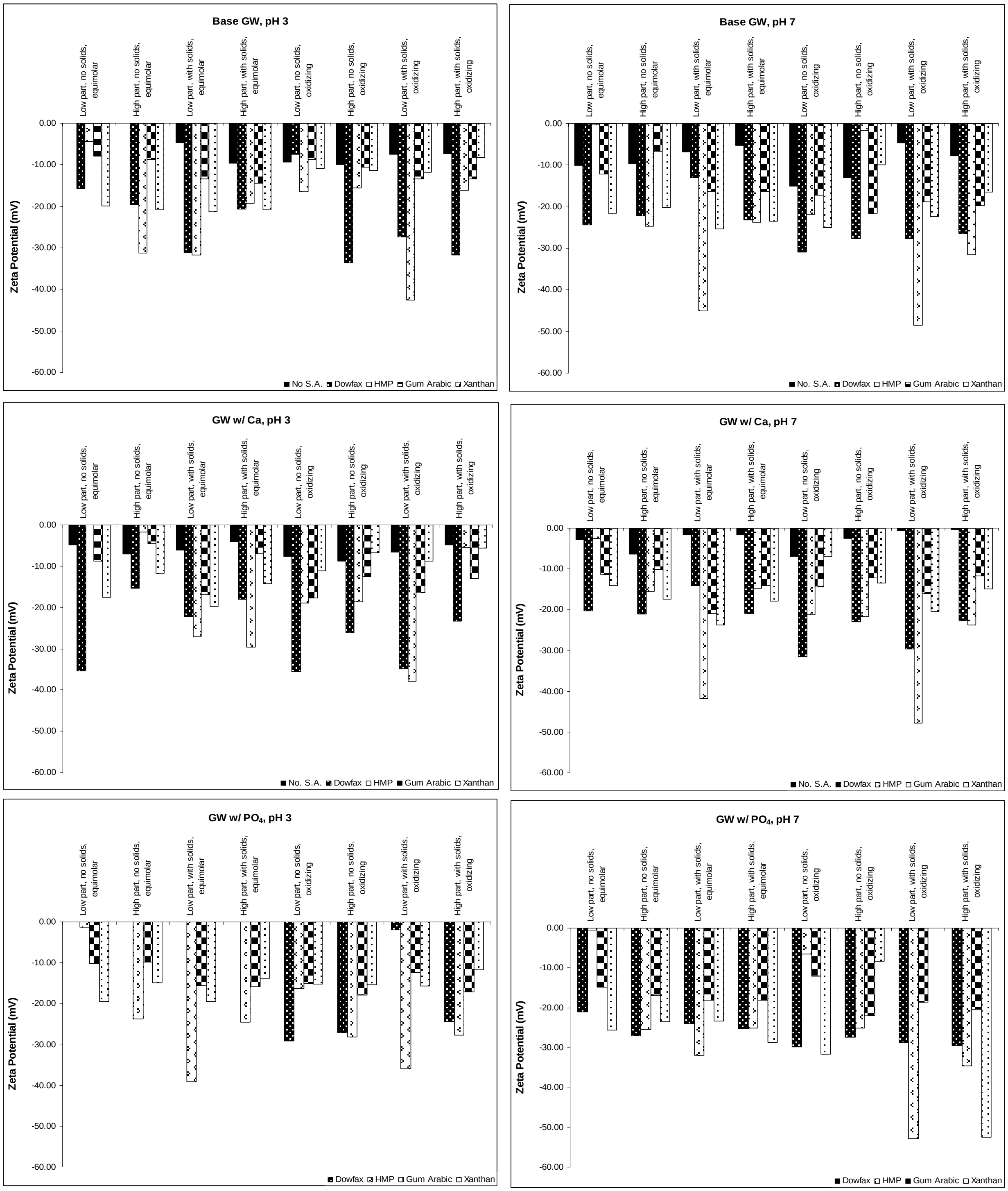
Xanthan Gum

Maximum stoichiometric particle concentration (high = 100mg/L, low = 10mg/L	pH	Groundwater (Base, Ca-rich, or PO4-rich	Solids	Redox	Stabilization aid	Time (hours)									
						0		0.5		4		24		72	
						zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)	zeta potential	avg. particle size (µm)
low	3	Base	none	equimolar	10mg/L Xanthan Gum	*	0.00	-13.33	0.00	-19.89	0.77	-10.75	0.55	-19.85	1.25
high	3	Base	none	equimolar	10mg/L Xanthan Gum	*	0.00	-17.78	0.78	-20.91	0.56	-20.14	0.54	-20.78	0.69
low	3	Base	1.1g sand	equimolar	10mg/L Xanthan Gum	*	0.00	-16.13	2.44	-21.63	3.08	-21.43	0.09	-21.34	0.93
high	3	Base	1.1g sand	equimolar	10mg/L Xanthan Gum	*	4.03	-18.70	0.78	-20.12	0.58	-20.48	0.50	-20.84	1.01
low	3	Base	none	oxidizing	10mg/L Xanthan Gum	-17.58	0.00	-14.95	0.00	-16.21	0.25	-19.93	0.57	-10.94	2.73
high	3	Base	none	oxidizing	10mg/L Xanthan Gum	-19.77	0.50	-20.87	0.46	-19.54	0.37	-11.91	3.84	-11.32	9.09
low	3	Base	1.1g sand	oxidizing	10mg/L Xanthan Gum	-18.87	45.99	-21.10	8.57	-20.33	3.78	-20.13	4.31	-11.79	7.65
high	3	Base	1.1g sand	oxidizing	10mg/L Xanthan Gum	-20.41	0.46	-19.18	0.32	-13.38	0.35	-9.92	1.23	-8.26	12.15
low	7	Base	none	equimolar	10mg/L Xanthan Gum	-6.99	0.00	-11.03	0.00	-20.17	0.66	-20.15	0.55	-21.62	0.60
high	7	Base	none	equimolar	10mg/L Xanthan Gum	-18.05	0.00	-25.24	0.82	-22.76	0.62	-20.05	1.02	-20.21	4.51
low	7	Base	1.1g sand	equimolar	10mg/L Xanthan Gum	-27.09	6.48	-25.60	2.87	-28.38	1.58	-26.57	2.07	-25.33	0.69
high	7	Base	1.1g sand	equimolar	10mg/L Xanthan Gum	-24.93	4.05	-17.97	1.58	-21.82	0.62	-19.59	0.59	-23.46	1.62
low	7	Base	none	oxidizing	10mg/L Xanthan Gum	-17.76	0.00	-14.06	0.00	-15.43	0.00	-20.47	0.00	-24.95	0.00
high	7	Base	none	oxidizing	10mg/L Xanthan Gum	-21.68	0.72	-25.33	0.35	-21.29	0.38	-15.09	*	-10.02	2.70
low	7	Base	1.1g sand	oxidizing	10mg/L Xanthan Gum	-28.11	8.50	-27.56	2.57	-26.54	2.44	-21.98	1.82	-22.35	1.67
high	7	Base	1.1g sand	oxidizing	10mg/L Xanthan Gum	-26.20	0.64	-26.19	0.69	-23.73	0.36	-19.34	3.91	-16.49	7.48
low	3	Ca	none	equimolar	10mg/L Xanthan Gum	-13.06	0.00	-14.06	0.00	-19.94	0.77	-15.53	0.38	-17.62	1.39
high	3	Ca	none	equimolar	10mg/L Xanthan Gum	-16.18	0.00	-12.17	0.99	-16.81	0.61	-14.73	0.96	-11.77	6.86
low	3	Ca	1.1g sand	equimolar	10mg/L Xanthan Gum	-21.21	7.30	-16.44	3.98	-21.36	1.41	-19.76	0.54	-19.76	1.03
high	3	Ca	1.1g sand	equimolar	10mg/L Xanthan Gum	-18.22	3.24	-12.72	1.12	-17.68	0.85	-13.72	0.98	-14.22	9.80
low	3	Ca	none	oxidizing	10mg/L Xanthan Gum	-13.85	0.00	-4.54	0.00	-19.32	0.00	-19.74	0.47	-11.11	10.34
high	3	Ca	none	oxidizing	10mg/L Xanthan Gum	-18.18	0.00	-16.96	0.79	-13.57	0.51	-13.37	0.59	-6.75	7.67
low	3	Ca	1.1g sand	oxidizing	10mg/L Xanthan Gum	-19.57	18.11	-21.12	4.84	-11.36	1.61	-18.41	0.47	-8.84	10.34
high	3	Ca	1.1g sand	oxidizing	10mg/L Xanthan Gum	-17.45	16.13	-16.26	0.40	-16.39	0.42	-13.94	0.99	-5.67	10.57
low	7	Ca	none	equimolar	10mg/L Xanthan Gum	-4.57	0.00	-5.67	3.24	-16.25	3.90	-14.76	0.82	-14.11	0.38
high	7	Ca	none	equimolar	10mg/L Xanthan Gum	-13.70	0.00	-12.75	1.88	-16.05	0.63	-16.06	0.46	-17.38	0.81
low	7	Ca	1.1g sand	equimolar	10mg/L Xanthan Gum	-24.22	9.93	-25.49	2.48	-25.00	2.57	-26.31	1.63	-23.80	0.94
high	7	Ca	1.1g sand	equimolar	10mg/L Xanthan Gum	-18.14	5.06	-19.36	1.85	-18.84	1.08	-18.04	0.72	-17.96	0.78
low	7	Ca	none	oxidizing	10mg/L Xanthan Gum	-15.53	0.00	-15.51	0.00	-13.98	0.00	-17.69	0.00	-6.91	0.00
high	7	Ca	none	oxidizing	10mg/L Xanthan Gum	-13.76	0.00	-6.85	0.00	-13.69	0.71	-17.43	0.58	-13.47	2.86
low	7	Ca	1.1g sand	oxidizing	10mg/L Xanthan Gum	-25.37	5.48	-23.79	7.13	-23.85	2.68	-25.22	2.11	-20.50	1.10
high	7	Ca	1.1g sand	oxidizing	10mg/L Xanthan Gum	-16.06	1.73	-16.16	1.44	-13.76	0.67	-13.98	0.57	-14.88	1.35
low	3	PO4	none	equimolar	10mg/L Xanthan Gum	-13.55	0.00	-17.48	0.00	-12.66	0.00	-19.50	0.61	-19.41	0.58
high	3	PO4	none	equimolar	10mg/L Xanthan Gum	-14.39	0.00	-16.84	0.99	-15.76	0.87	-16.28	0.95	-14.84	1.29
low	3	PO4	1.1g sand	equimolar	10mg/L Xanthan Gum	-19.30	3.72	-20.23	1.97	-18.89	1.53	-21.08	4.58	-19.46	0.59
high	3	PO4	1.1g sand	equimolar	10mg/L Xanthan Gum	-18.36	2.51	-16.68	1.38	-17.86	1.16	-16.42	1.09	-13.81	1.24
low	3	PO4	none	oxidizing	10mg/L Xanthan Gum	-15.63	0.00	-20.10	0.99	-20.04	0.92	-18.93	0.92	-15.23	1.97
high	3	PO4	none	oxidizing	10mg/L Xanthan Gum	-15.09	0.00	-16.17	0.42	-16.81	0.49	-16.23	0.74	-15.32	1.59
low	3	PO4	1.1g sand	oxidizing	10mg/L Xanthan Gum	-18.39	15.06	-17.35	5.18	-19.84	1.16	-19.28	1.01	-15.72	2.11
high	3	PO4	1.1g sand	oxidizing	10mg/L Xanthan Gum	-15.05	5.19	-17.62	0.70	-17.72	0.64	-17.28	0.81	-11.70	0.47
low	7	PO4	none	equimolar	10mg/L Xanthan Gum	-17.77	0.00	-18.20	0.00	-13.19	0.00	-14.78	0.98	-25.65	0.57
high	7	PO4	none	equimolar	10mg/L Xanthan Gum	-10.38	0.00	-17.97	0.00	-21.82	0.55	-19.59	0.95	-23.49	0.63
low	7	PO4	1.1g sand	equimolar	10mg/L Xanthan Gum	-24.14	3.23	-25.54	2.30	-23.40	1.47	-21.24	0.53	-23.27	1.01
high	7	PO4	1.1g sand	equimolar	10mg/L Xanthan Gum	-26.20	3.51	-27.35	7.72	-20.67	1.35	-25.19	1.61	-28.73	0.78
low	7	PO4	none	oxidizing	10mg/L Xanthan Gum	-15.38	0.00	-24.38	0.00	-18.91	0.00	-18.78	0.00	-31.59	0.99
high	7	PO4	none	oxidizing	10mg/L Xanthan Gum	-2.92	0.00	-18.33	0.00	-21.12	0.45	-18.13	0.58	-8.31	0.36
low	7	PO4	1.1g sand	oxidizing	10mg/L Xanthan Gum	-24.37	7.86	-25.39	2.37	-23.16	2.31	-22.19	1.61	*	0.92
high	7	PO4	1.1g sand	oxidizing	10mg/L Xanthan Gum	-25.39	2.54	-26.16	1.58	-25.97	0.78	-24.99	0.66	-52.58	0.87

*data unavailable

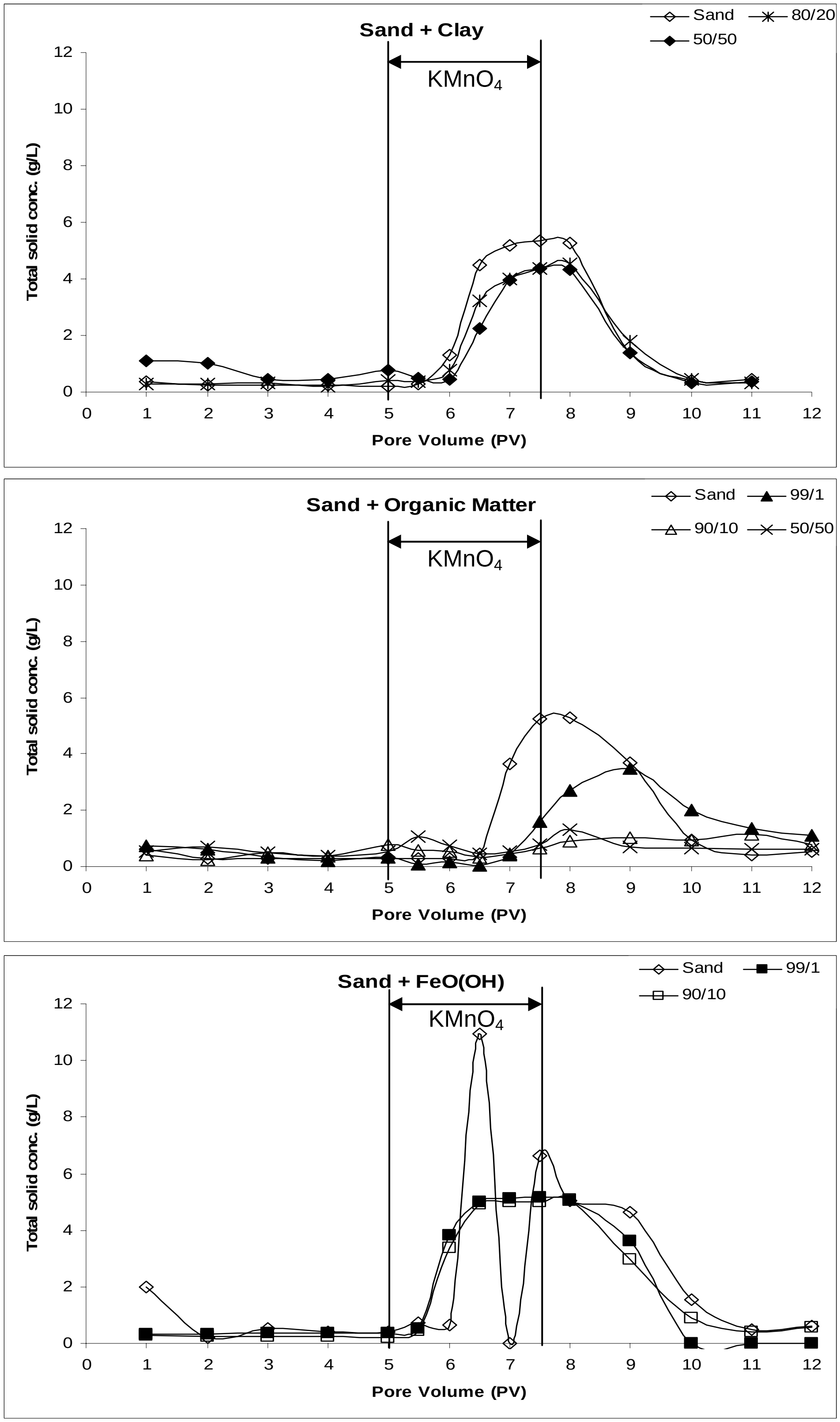


Average particle size of samples of high concentration stabilization aids under various reaction conditions.

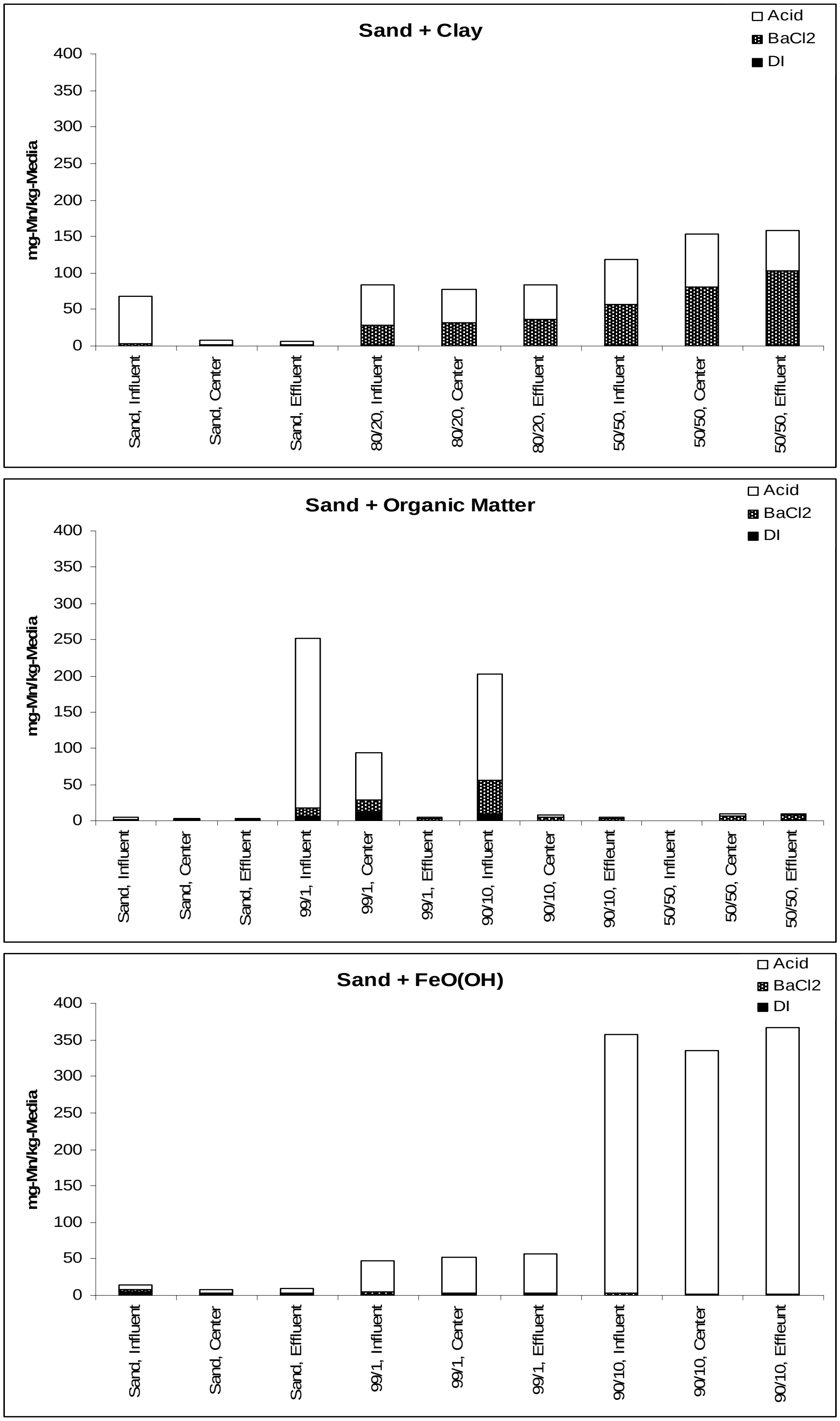


Zeta potential of samples of high concentration stabilization aids under various reaction conditions.

Appendix IX. Representative Results for Initial Mini-Column Range-Finding 1-D Transport Experiments



Total solids concentrations over pore volume of delivery for varied porous media



Mass of Mn (as MnO_2) per kg of media in sectioned columns for varied porous media.